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GEORGE NOBBS LIMITED



water heaters

ELECTRICAL HEATING
ENGINEERS & MANUFACTURERS

ELECTRIC WATER HEATING

and other applications of Electrical Heating.

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ENERGY for water heating purposes is to-day available in four forms, the energy of solid fuel such as coal, coke or wood, the energy of liquid fuel such as petroleum or paraffin, the energy of gaseous fuel such as ordinary town gas, and finally electrical energy.

Without doubt the fourth, electrical energy, is easily first as regards efficiency of conversion to useful heat energy, convenience of application, cleanliness and low attendance charges.

The principal difficulties in the way of the wide-spread adoption of electric water heating have been lack of knowledge of its possibilities, high cost of electrical energy and poorly made apparatus not conforming with the ordinary requirements of hot water engineering. Fortunately, many Electric Supply Authorities are now adopting a progressive policy and in many instances electrical energy is very cheap, being in some cases less than one penny per unit.

When we say that with "Genii" Electric Water Heating Apparatus, one unit of electricity will raise two gallons of water to boiling point, or six gallons to hot bath temperature, it will be appreciated that electric water heating is indeed economical and inexpensive.

With electricity at one penny per unit, the water for tea for five or six persons would cost about one-third of a penny and a 24-gallon bath about 4d.

The firm of GEORGE NOBBS, LTD., was originally established in 1850 as "Hot Water and Steam Engineers," so that in specifying "Genii" Electric Water Heating Apparatus you ensure obtaining apparatus embodying over 60 years hot water engineering experience.

Three methods of electric water heating are available and the choice will depend on the local conditions of application and the arrangements for the supply of electricity, but whichever system is chosen the number of electrical units required to raise a given quantity of water through a given temperature and time is approximately the same.

The three methods are :—

1. The hot water *storage* method.
2. The *portable* Immersion Heater method.
3. The *instantaneous* or geyser method.

1.—The "storage" method of employing "Genii" Immersion Heaters may be broadly sub-divided into : (a) the system of ample hot water storage capacity with low electrical loading running continuously at 100 per cent. load factor or at off peak times, and (b) the system of moderate hot water storage and medium electrical loading used intermittently.

2.—The "Portable Immersion Heater Method" likewise may be divided into systems in which : (a) a "Genii" Portable Immersion Heater of low electrical loading can be left running for a long period, *e.g.*, as in a bath left to be heated during the night, or, (b) a "Genii" Portable Immersion Heater is employed of electrical capacity sufficient to perform a given duty in a comparatively short time, *e.g.*, a hot bath required at say 15 to 30 minutes or an hour's notice.

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In the instantaneous or Geyser method, "Genii" Immersion Heaters of sufficient capacity are fixed within a water vessel to heat the water passing through it, thus providing hot water instantly on demand.

From the point of view both of the Electricity Supply Authorities and the Consumer, the "low wattage, continuous run" or "long hour" system is undoubtedly the best.

The medium wattage storage system has a load factor of 25 to 50 per cent. and therefore comes under the ordinary power rates which are not so favourable as for the 100 per cent. load factor low wattage storage system.

The instantaneous water heater or geyser has a comparatively low load factor. It is not favoured by most Electricity Supply Authorities and requires special heavy wiring circuits. Of the three systems, it is therefore probably the most costly, for the electrical energy consumed. However, to meet the demand for high loading apparatus, the "Genii" High Wattage Water Heaters or Bath Immersers will fulfil most requirements.

The choice of electric water heating system having been made, it is next necessary to decide what size of installation will be required to adequately meet the particular requirement. With "Genii" apparatus it may be assumed as an all-round figure to simplify calculations that :—

1 unit	will raise the temperature of 300 gals. of water	1° F.
or 1	" " " " " " 6	" " 50° F.
and 1	" " " " " " 3	" " 100° F.
and 1	" " " " " " 2	" " 150° F.

which starting with water at 62° F., a fairly normal indoor temperature means that :—

1 unit	will heat 6 gallons of water to bath temperature.
1	" " " 3 " " " washing up (kitchen) temperature.
1	" " " 2 " " " boiling temperature.

As an illustration of this simple rule, the question might arise how much electricity will be consumed in heating water for a bath for an adult person? Since one unit heats 6 gallons to bath temperature, a 30 gallon bath will require 5 units, or a smaller bath say 18 gallons for 3 units.

If the heating is done by the "Genii" Push System with 24 hours continuous loading, the rating to consume 5 units would be $\frac{5}{24}$ kW., or just over 200 watts. If a "Genii" Bath Type Portable Immerser or Geyser Heater is chosen and a large bath has to be prepared from cold in 20 minutes ($\frac{1}{3}$ hour), the rating must be $\frac{5}{\frac{1}{3}} \text{rd} = 15 \text{ kW.}$

When installing a "Genii" Hot Water Storage System, the total requirements for all points supplied such as baths, lavatory basins, kitchen and scullery sinks, etc., must be taken into account. Boiling water for tea and coffee making can be drawn from the storage heater and raised quickly to boiling point in an electric kettle. Continuing the example, let us suppose the case is for a hot water supply for a household of five persons. Allowing say one bath per day, the consumption for bath and lavatory basins might be

taken as 36 gallons, while that for washing-up, sinks and cullinary purposes at 6 gallons per day. The total consumption of electricity would then be :—

$$36 \text{ gallons at bath temperature} \div 6 = 6 \text{ units.}$$

$$6 \text{ „ washing-up} \div 3 = 2 \text{ units.}$$

The correct rating on a 24 hour continuous load therefore would be $8 \div 24 = .33\text{kW}$.

A suitable recommendation, where only one tank is desirable, would be a 40-gallon storage cylinder with 500 watt loading, running continuously. *Where possible it would be preferable to install two or more smaller storage heaters to save piping and loss of heat therefrom*, such as a 20-gallon 250 watt tank in bath room, a 10-gallon 150 watt for kitchen, and a 100 watt P.S. Type Heater for a bedroom or other isolated lavatory basin. It should be noted that with 500 watt loading on a 40-gallon storage cylinder, an incoming gallon of cold water will be heated to lavatory basin temperature in 1/6th of an hour, i.e., in 10 minutes, or to kitchen sink temperature in 20 minutes. Consequently, if water for these purposes is not required at closer intervals than those just stated, this system would meet all demands.

In determining whether to instal the ordinary hot water supply apparatus with storage cylinder and distributing pipes, or the "push system," it should be remembered that the first is very suitable where a hot water cylinder or tank apparatus is already installed. In such cases all that is necessary is the fitting of the appropriate "Genii" Immersion Heater to the tank. Test Charts showing the temperature rise with various loadings on a 20-gallon lagged tank, and other heaters, are given in the relevant leaflets.

The "Push System" is particularly suitable for fitting over baths, lavatory basins, sinks, etc., *thus eliminating running of hot water services from a possibly distant storage tank, and the attendant heat losses and waste of current therefrom*. Further details of the apparatus for the three systems will be found in the relevant leaflets.

Closely allied to electric hot water heating are small installations for producing distilled water with electric heating. With "Genii" Distillers, one gallon of distilled water is produced for every four units of electricity, which compares very favourable with the current rate of 6½d. per gallon for distilled water in carboys. They, furthermore, have the advantage of providing *chemically pure* distilled water and of saving all handling charges and that the distilled water is produced as and when required, and the addition of hot cooling water at 180°—190° F., which is available for hot water purposes or may be cooled and re-used in the Still.

Our long experience as hot water engineers make us fully appreciate the merits of standardisation and interchangeability, and it will therefore be found that the heating elements in the "Genii" products are wherever possible standard "GENII" Immersion Heaters.

A special Service Department is maintained by us, which is always ready and willing to assist and advise on Electrical Water Heating, Industrial Heating and Cooking Problems, and to send competent mechanics to undertake repair work in any part of the U.K. and abroad, for and on behalf of Contractors.

The range of "Genii" Products is given below and leaflets dealing with them will be forwarded on request.

IMMERSION HEATERS.

Fixed and Portable Models

PUSH SYSTEM OF HOT WATER STORAGE HEATERS.

INSTANTANEOUS AND GEYSER TYPE WATER HEATERS.

DISTILLING APPARATUS.

HOT WATER RADIATORS FOR TRACTION, LAND & MARINE WORK.

CONVECTORS AND HEATERS

For Industrial Purposes. Train, Tram and Ship Heating.

FOOT AND BED WARMERS.

KETTLES AND GLUE HEATERS.

TOWEL AND GOWN RAILS.

COOKING APPARATUS.

WARMING PLATES, etc., etc.

Fundamental Formulæ connecting :—Kilowatts, Gallons of Water, and Time in Hours.

The Constant 300 used in the following formulæ applies to apparatus with an efficiency of 88 per cent. For apparatus of 96 $\frac{3}{4}$ per cent. efficiency substitute 330 instead of 300 and for apparatus of 82 per cent. efficiency substitute 280 in lieu of 300. For apparatus of x efficiency, divide the constant 300 by 88 and multiply by x and use the result as the new constant in the equation instead of 300.

Formulæ for Water Apparatus of 88 per cent. efficiency.

1. To determine loading required to raise given quantity of water through given temperature rise per hour :—

$$\text{Kilowatts} = \frac{\text{Gallons} \times \text{Temperature rise.}}{300}$$

- 2.—To determine loading required to raise given quantity of water through given temperature in given time :—

$$\text{Kilowatts} = \frac{\text{Gallons} \times \text{Temperature}}{300 \times \text{time in hours.}}$$

- 3.—To determine time required for a given loading to raise a given quantity of water through a given temperature rise :—

$$\text{Time in hours} = \frac{\text{Gallons} \times \text{Temperature rise}}{300 \times \text{Kilowatts}}$$

- 4.—To determine temperature rise per hour for a given loading acting on a given quantity of water :—

$$\text{Temperature rise per hour} = \frac{300 \times \text{kilowatts}}{\text{gallons.}}$$

- 5.—To determine the temperature rise after a given time for a given loading, acting on a given quantity of water :—

$$\text{Temperature rise} = \frac{300 \times \text{kilowatts} \times \text{time in hours}}{\text{gallons}}$$

- 6.—To determine the quantity of water per hour which would be raised through a given temperature rise with a given loading :—

$$\text{Gallons per hour} = \frac{300 \times \text{kilowatts}}{\text{temperature rise}}$$

- 7.—To determine the quantity of water heated a given temperature rise with a given loading applied for a given number of hours :—

$$\text{Gallons} = \frac{300 \times \text{kilowatts} \times \text{time in hours}}{\text{temperature rise.}}$$

GEORGE NOBBS LTD.

Governing Director : C.G.Nobbs, M.I.E.E., M.I.H.V.E., ETC. Secretary: F.E.Nobbs.

Electrical Engineers & Manufacturers.

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"GENII"

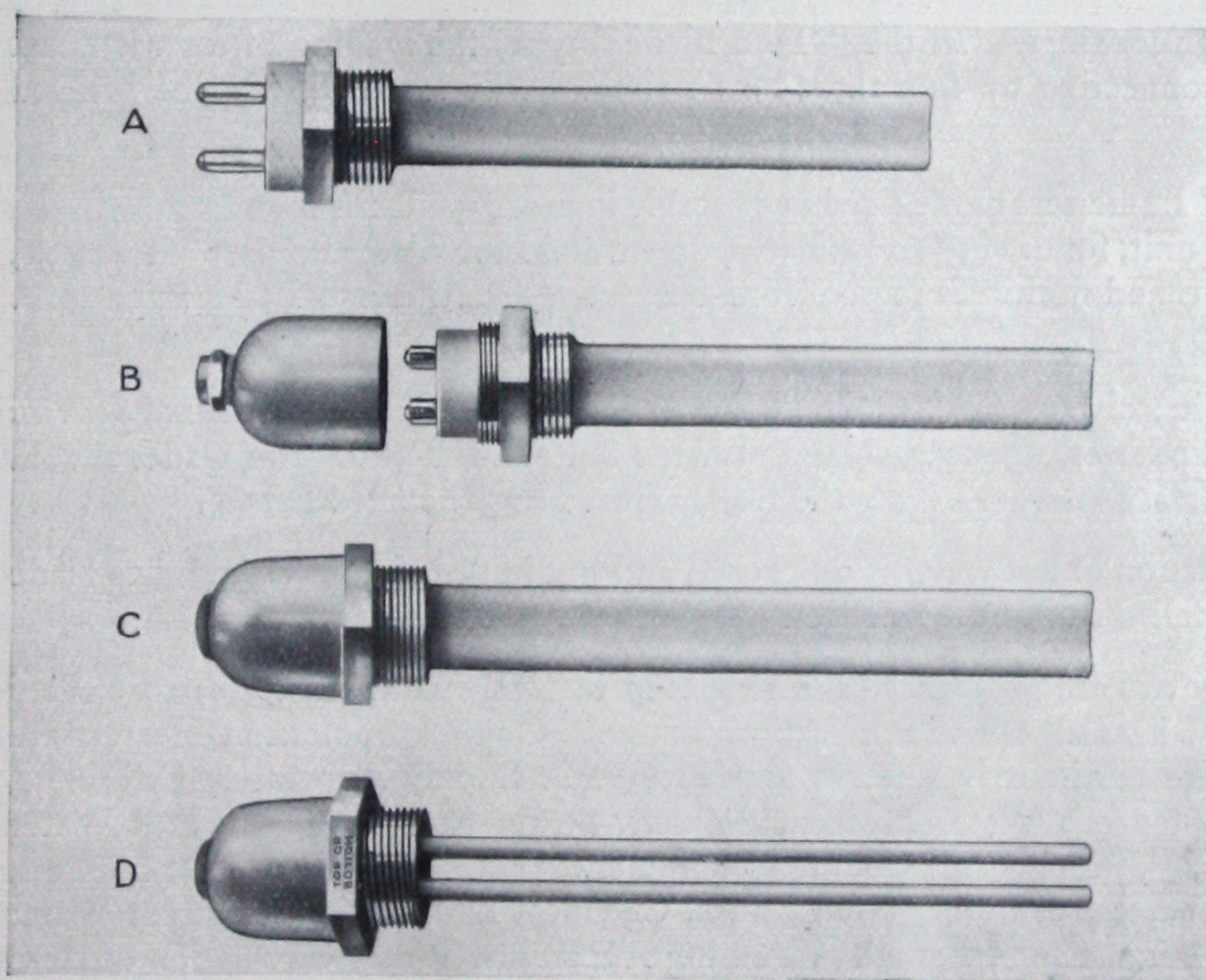
IMMERSION HEATERS

(BLADE TYPE)

Patent Nos.: British—12318/15, 18891/18, 150074 and 153513.
United States America—268310. Others pending.

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THE "Genii" Immersion Heater will be found to be the heat unit in the majority of "Genii" Heating Apparatus. This form of heater was adopted because, as the name itself implies, the heater is immersed in the liquid to be heated, and consequently, practically the whole of the heat generated is absorbed by the liquid.



With "Genii" Immersion Heaters the only loss of heat is that radiated from the cap which protects the electrical connections, which are made outside the vessel. Consequently the actual thermal efficiency of "Genii" Immersion Heaters is from 97.5 to 99.5 per cent. In the best "clamp-on" systems, the efficiency is from 70 to 80 per cent., while with "hot-plate" methods the heat transference efficiency is to the order of 50 per cent.

The essential feature in the construction of an Immersion Heater is positively to ensure that the exterior metal tube or casing is—except for

the electrical insulation—in actual contact through its length with the interior electric heating element. The "Genii" Immersion Heater is the product of 15 years' experience and is manufactured under patented forms of construction expressly designed to *permanently* maintain this feature which is essential in ensuring long life for the heater.

The necessity for this positive and permanent contact between heating element and outer casing will be readily understood on considering how the heat generated in the electric element is transferred to the surrounding liquid. In a "Genii" Immersion Heater, the electric element on becoming heated by the passage of the electric current, transfers the heat by *conduction* to the exterior heavy gauge tinned copper casing, and thus to the liquid to be heated.

The most common fault in low priced Immersion Heaters, which are debarred from the patented form of construction, is that sooner or later the actual contact between element and outer tube is broken in one or more places—mostly due to expansion, etc., under working conditions. The effect of this

separation is that a smaller area is available for transferring the heat by conduction due to the smaller actual contact with the outer tube. This results in "hot spots" in portions of the heating element and eventually, after a short life, the heater is burnt out.

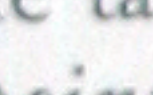
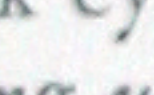
Piece-work, boy labour, and mass production methods are not followed in the production of "Genii" Immersion Heaters. On the contrary, they are made individually by workmen specially skilled and trained in this work, no hygroscopic materials are used in the construction and the Immersers are flash tested at four times the working pressure. The result is a high grade Heater, which, although higher than some in initial cost, is unquestionably lower in annual cost in giving satisfactory performance throughout a long life.

From an installation point of view, "Genii" Immersion Heaters are equally satisfactory. They are made in many sizes, and all threads are standard iron pipe sizes. The loadings are all well chosen multiples and sub-multiples of the kilowatt. "Genii" Heaters are very easy to fit in new apparatus, or in converting existing boilers or gas apparatus to electric heating. This can be done with unskilled labour in a fraction of the time necessary with "clamp-on" systems.

Fitting can usually be effected with the "Genii" Immerser by means of a screwed boss or flange, into which the Heater is screwed. Where it is impossible to fix a boss or flange, the boring of a clearing hole and the securing of the Heater with an ordinary backnut, washer and joint is all that is necessary. A special form of detachable flange connection is described later. These flanges can be fitted to existing cylinders or tanks without disturbing the tanks, its manhole cover, or the existing piping connection. Renewals and exchange of Immersers for any voltage or loading can be made in a few minutes as compared to hours of skilled labour with "clamped-on" systems.

"Genii" Immersion Heaters are made single blade for the smaller loadings and with two or more blades for medium and high loadings. In the "Two Blade" type, the loading of each is equal and terminals are provided for connecting up to a three-heat switch. The terminals may be bridged for single heat.

Multiple Blade "Genii" Immersers of the fixed or portable type are made for high loadings from 4 or more kilowatts per Immerser unit, for use in Private Baths, Steam and Hot Water Boilers, Oil Vessels, etc., and from 20 to 50 kW. units and multiples thereof for Locomotive, Marine and Land Type H.P. Steam Boilers.

To obtain the best results, always fix "Genii" Immersion Heaters in a *horizontal position through the SIDE* of the tank cylinder or other vessel, and near the bottom. The Heater blades should have the narrow edge *pointing upwards* thus: — ; the blades must NOT be fixed flat .

By fixing correctly, circulation of hot water is quickened and not impeded, and there is less blade surface for sediment or furr to fall on to and so collect.

"Genii" Immersion Heaters are guaranteed; care should therefore be taken to see that every Heater bears our trade mark "GENII." The applications of the "Genii" Immersion Heaters are exceedingly numerous. They are particularly suitable for Hot Water Supply Apparatus, Calorifiers, Water and Steam Boilers, Instantaneous Water Heaters, Geysers, Steam Cooking Plant, Hot Water Urns, Boilers of Counter Fountains, and general Counter Equipment, Egg Boilers, Poachers, Mullers, Milk Boilers, and for Distilled Water Apparatus, Glue Tanks, Chemical Baths, Sterilisers, Hot Water and Steam Radiators, Bottle Washing Tanks, Laundry Washing Apparatus, Water Circulation of Aero and Automobile Engines for the prevention of attack due to frost, Crude Oil Storage Tanks, Water Jacketed Ovens, Paraffin Baths, etc.

The application of "Genii" Immersion Heaters to any of these purposes is equally successful on a new installation or as a conversion from another form of heating. There are, no doubt, many other applications of the "Genii" Immersion Heaters, and we shall always be glad to place our long experience at your disposal in arriving at the best method of utilising "Genii" Immersion Heaters for a particular application. Our assistance will always be more effective, however, if when writing you also supply a rough sketch giving the leading dimensions of the apparatus you wish to construct or convert, and the duty it is required to perform.

VOLTAGE.—"Genii" Immersion Heaters are available for the following voltages:—50, 75, 100, 105, 110, 115, 120, 150, 200, 210, 220, 230, 240, 250 and 260. "Two BLADE" and "Three BLADE" Type Immersers can be used for medium pressures by connecting the blades in series by the terminals provided. Immersers for other voltages and sizes will be made to order.

“GENII” FIXED TYPE IMMERSION HEATERS.

ONE BLADE MODELS, single heat, fitted with brass bush screwed iron pipe size, pin plug terminals $\frac{1}{4}$ in. diameter at $\frac{5}{8}$ in. centres (illustrated “A”) or two screw terminals with brass cap (as illustrated “B”).

WATTS	Size of Thread I.P.S.	Overall Length of Blade and Thread		Approximate Weight		CODE & CATALOGUE NUMBERS	
		inches	cms.	lbs.	k.g.	Pin Plug Terminals	Screw Terminals & Cap
100	$\frac{3}{4}$ in. size. (14 threads per inch)	6	15.2	0.43	0.21	100	101
250		6	15.2	0.43	0.21	102	103
500		10 $\frac{1}{2}$	26.6	0.62	0.28	104	105
250	1 in. size. (11 threads per inch)	4 $\frac{1}{2}$	11.5	0.65	0.30	106	107
500		7	17.8	0.80	0.36	108	109
750		9 $\frac{3}{4}$	25.7	0.93	0.42	110	111
1000		12	30.5	1.12	0.51	112	113

TWO BLADE MODELS have two equal heat windings, one in each blade suitable for two or three heat regulation fitted with brass bush screwed iron pipe size, three screw type terminals with brass cap (as illustrated at “C.D.”).

WATTS	Size of Thread I.P.S.	Overall Length of Blade and Thread		Approximate Weight		CODE AND CATALOGUE NUMBERS
		inches	cms.	lb.	k.g.	
500	1 $\frac{1}{4}$ ins.	4 $\frac{1}{2}$	11.5	1.40	0.64	120
750	1 $\frac{1}{4}$ ins.	5 $\frac{3}{4}$	14.6	1.55	0.70	122
1000	1 $\frac{1}{4}$ ins.	7	17.8	1.70	0.77	124
1000	1 $\frac{1}{2}$ ins.	6 $\frac{1}{2}$	16.5	2.75	1.25	126
1500	1 $\frac{3}{4}$ ins.	9 $\frac{1}{2}$	24.1	1.85	0.85	128
1500	1 $\frac{1}{2}$ ins.	8 $\frac{3}{4}$	22.2	3.00	1.40	130
2000	1 $\frac{1}{2}$ ins.	11	28.0	3.37	1.53	132
2500	1 $\frac{1}{2}$ ins.	13 $\frac{1}{4}$	33.5	3.75	1.70	134
3000	1 $\frac{1}{2}$ ins.	15 $\frac{1}{2}$	39.5	4.18	1.90	136

THREE BLADE MODELS are similar in appearance to the Two Blade type as illustrated “C.D.” but have three blades fitted to a 2 inch I.P.S. brass bush with screw type terminals for heat regulation and enclosed in brass cap.

WATTS	Size of Thread I.P.S.	Overall Length of Blade and Thread		Approximate Weight.		CODE AND CATALOGUE NUMBERS
		inches	cms.	lbs	k.g.	
2000	2 in. size (11 threads per inch)	8	20.3	4.20	1.90	140
2500		9	23.0	4.55	2.06	142
3000		11	28.0	4.90	2.22	144
3500		12 $\frac{1}{2}$	31.8	5.20	2.36	146
4000		13 $\frac{1}{2}$	34.3	5.40	2.45	148

SWITCH SETS FOR HEAT REGULATION.

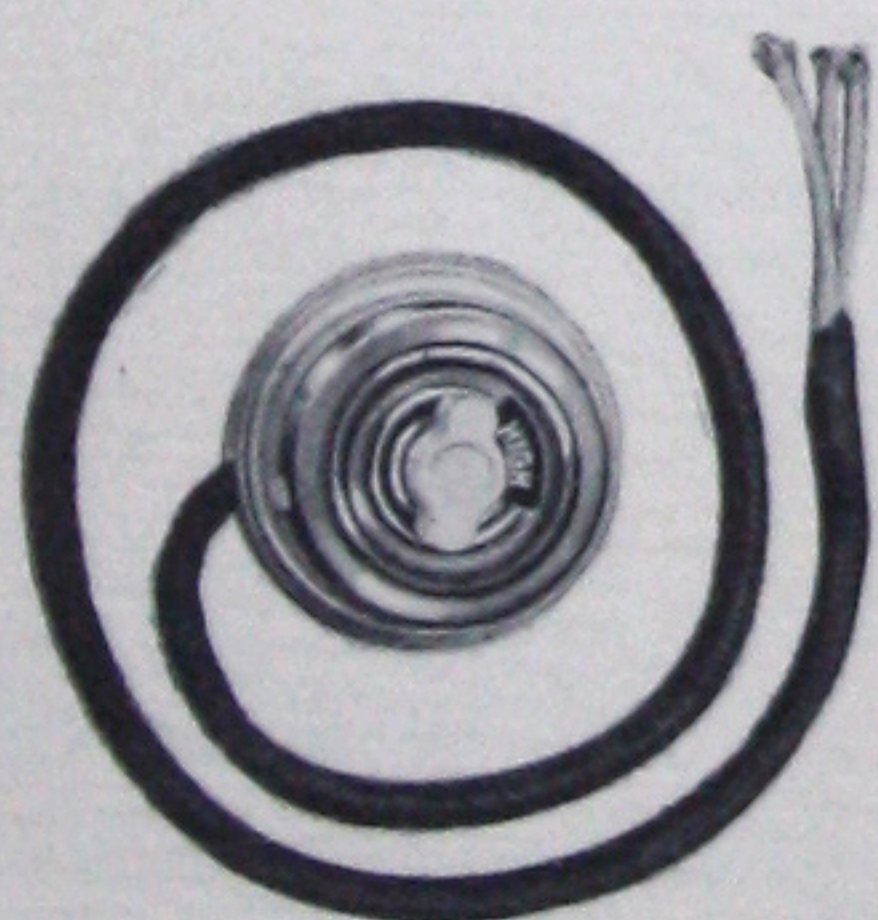


FIG. 1.

Suitable for operating ONE, TWO and THREE BLADE “GENII” Immersion Heaters, comprising: A turn pattern Indicating switch, having metal lined cover and porcelain base, the switch mounted on a wood block and connected with 3 feet (1 metre) of best quality flexible cable to the terminal box of the Immersion Heater.

SIZES—	5-7 Ampere Set		10-15 Ampere Set		20-30 Ampere Set	
HEATS	Single heat	Three heat	Single heat	Three heat	Single heat	Three heat
CODE Nos. }	150	151	152	153	154	155
FIGURE I... }						

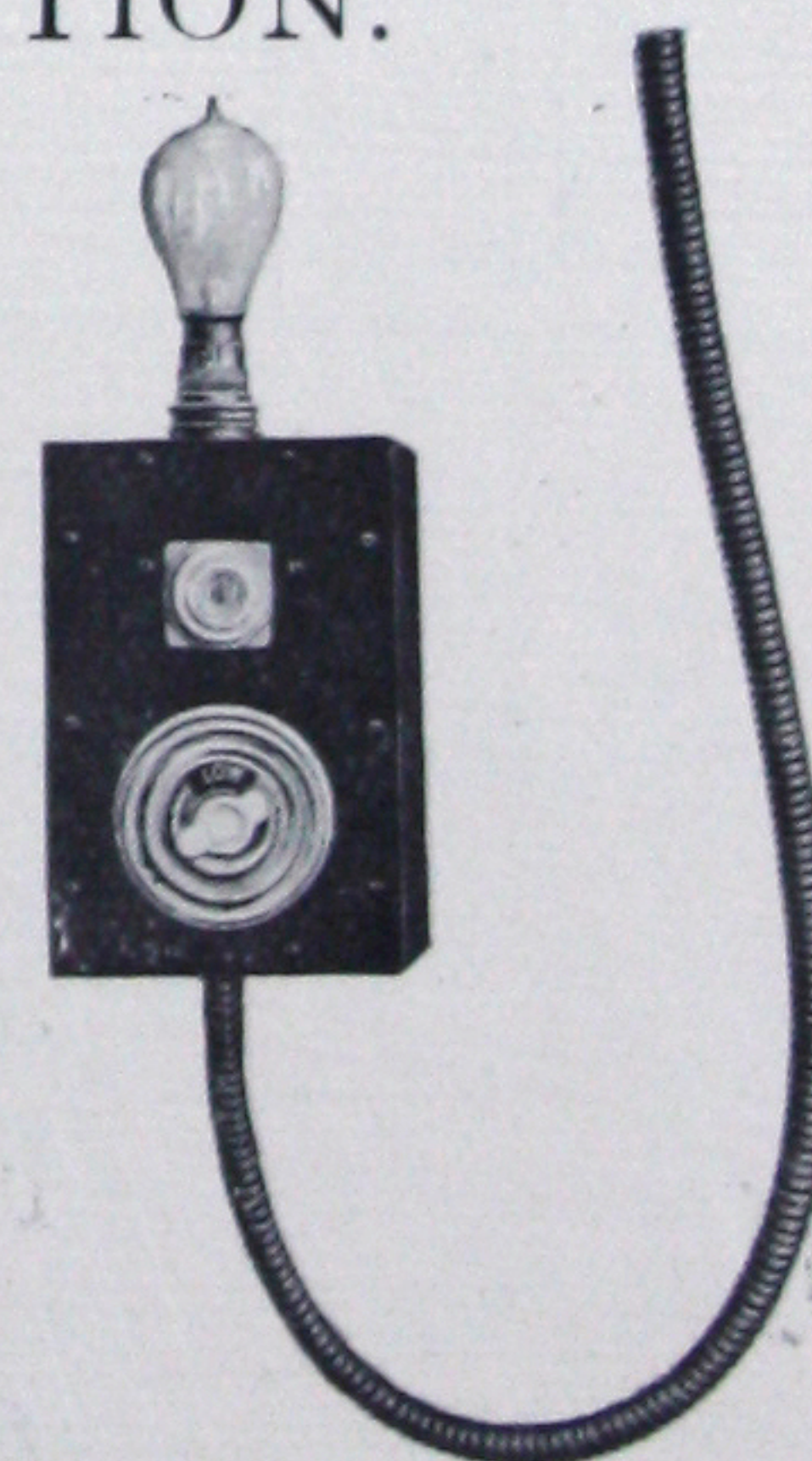


FIG. 2.

For details see next page.

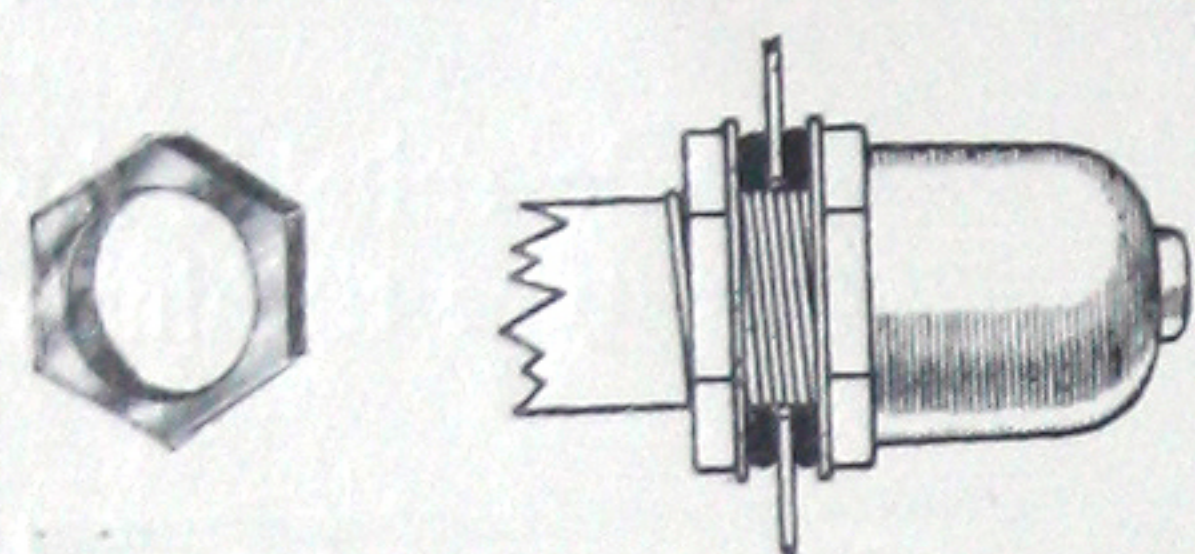
SPECIAL SWITCH SETS as Fig. 2 previous page.—Iron or wood cased Switchboard fitted with Indication turn switch, cartridge fuse, pilot lamp holder, wiring enclosed in 3 ft. length of flexible metallic tubing and all connections made to two service terminals behind the switch board.

SIZES—	5-7 Ampere Set		10-15 Ampere Set		20-30 Ampere Set	
	Single heat	Three heat	Single heat	Three heat	Single heat	Three heat
HEATS						
CODE Nos.	160	161	162	163	164	165

FIXINGS FOR IMMERSION HEATERS.

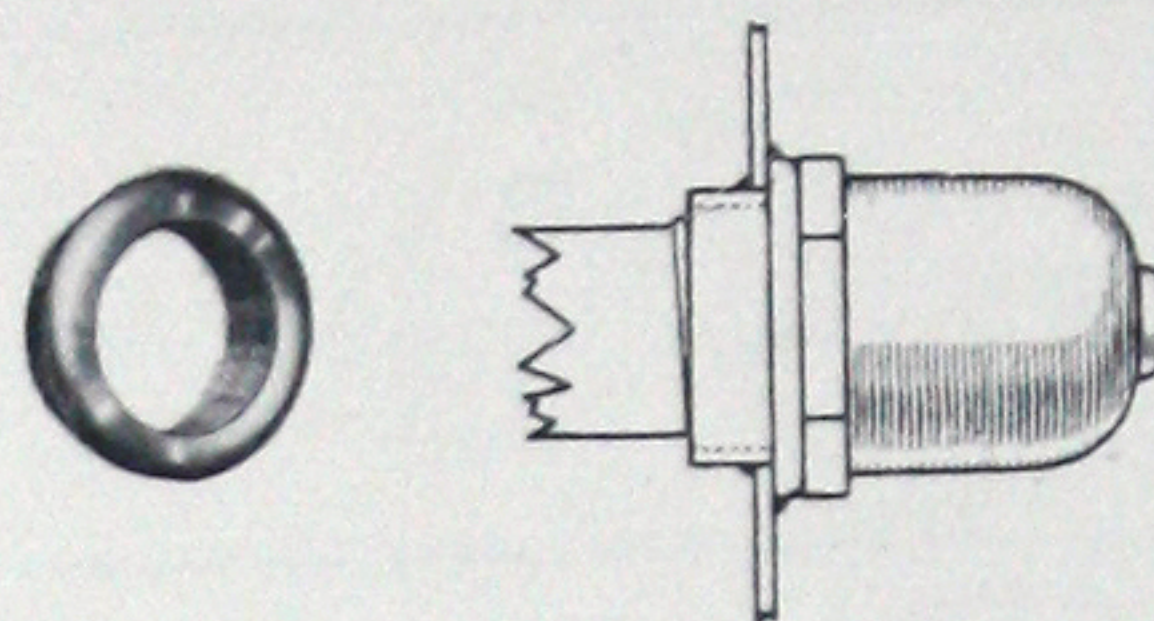
Back or Lock Nuts.

FIG. 1



Threaded Boss for Soldering.

FIG. 2.



Detachable Flange Connection.

FIG. 3.

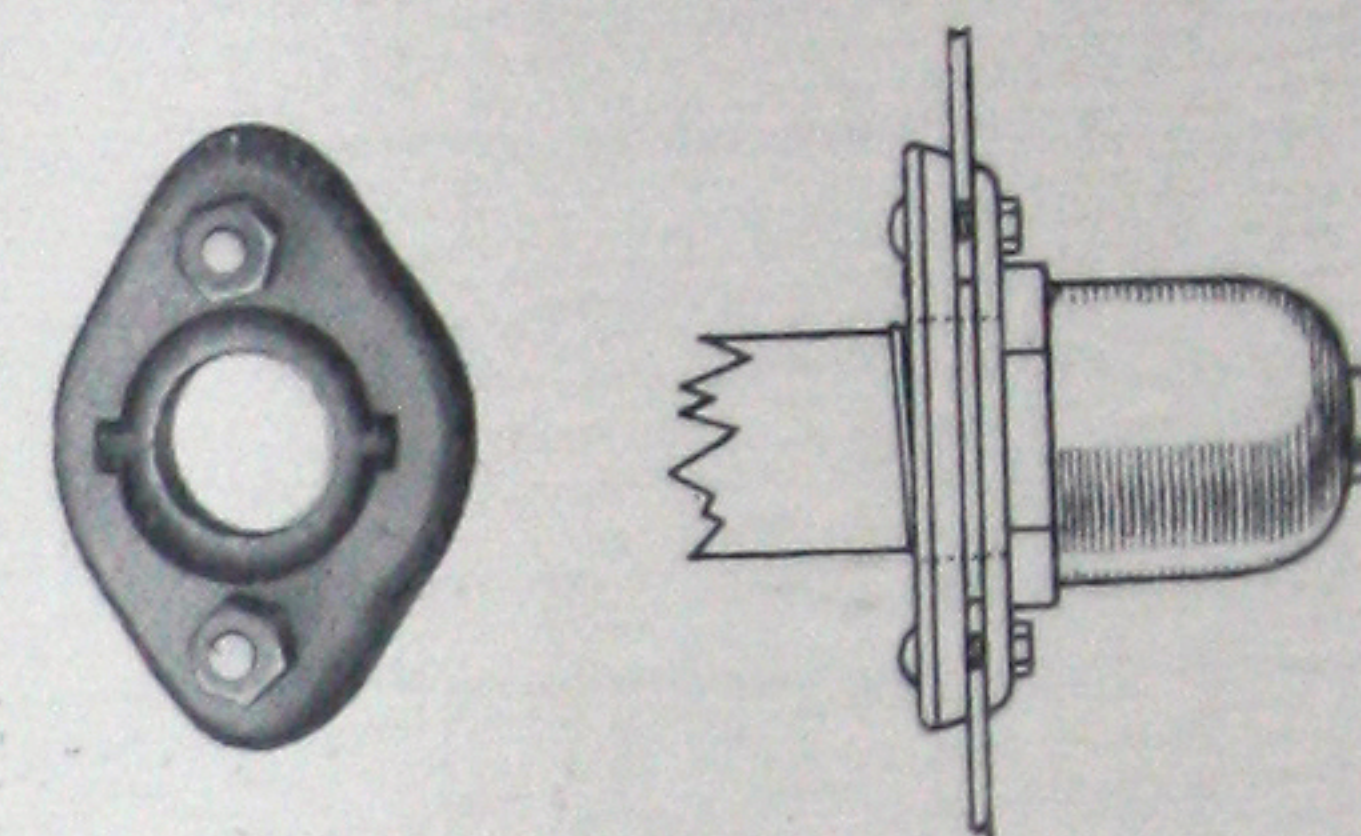


FIG. 1.—A simple method of fixing a "GENII" Immerser is by means of the common Back or Lock Nut. A clearing hole should be drilled in the cylinder or vessel, the Heater Bush inserted and made watertight by tightening up the hexagon Lock Nut with the usual red and white lead joint with hemp or asbestos grummet and washer.

FIG. 2.—A better fixing is obtained by use of a Brass Boss threaded inside with the correct I.P.S. screw thread, the boss should be well soldered into the vessel and the Immerser can then be made watertight to the Boss by the usual red lead and hemp joint.

FIG. 3.—Shews a detachable Flange Connection that may be fitted to galvanised iron or copper cylinders with or without manlids or cleaning covers. It also has the great advantage that it may be fitted to existing cylinders without taking the cylinder down or removing the manlid or any existing piping connections.

These Flanges are sent out complete with Template, Rubber Washer, Bolts, Wire Holder, and full instructions for fixing and are supplied in galvanised iron or in brass well tinned on the water side.

SCHEDULE OF SIZES, CODE AND CATALOGUE NUMBERS.

Thread Iron	British Standard Threads	Back Nuts (brass) Fig. 1	Bosses (brass) Fig. 2	Detachable Flanges Fig. 3	
				Galvanized	Brass
pipe size	per inch	Code No.	Code No.	Code No.	Code No.
$\frac{3}{4}$ in.	I 4	170	175	180	185
I in.	II	171	176	181	186
$1\frac{1}{4}$ in.	II	172	177	182	187
$1\frac{1}{2}$ in.	II	173	178	183	188
2 in.	II	174	179	184	189

GEORGE NOBBS LTD.

Governing Director: C.G. Nobbs, M.I.E.E., M.I.H.V.E., ETC. Secretary: F.E. Nobbs.

Electrical Engineers & Manufacturers.
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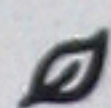
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TELEPHONE:
MUSEUM, 3455
Codes: A.B.C. 5th Edition.

"GENII" ELECTRIC BOILER

Made for any Single Voltage, and Adjustable Voltage Type for all Standard Voltages.



THE "Genii" Electric Boiler, has a large heating capacity in a compact form, combined with small weight, and indestructible construction. It is made in two types, one for any single circuit, and an Adjustable Type (as illustrated) having a change-over switch handle which is instantly adaptable for any standard circuit of 100-250 volts as may be required.

It is extremely economical and will boil liquid in small or large quantities, whether in a cup, kettle, or washhand jug. It will dry and sterilise itself in an instant when taken from the liquid and not drip "all over the place."

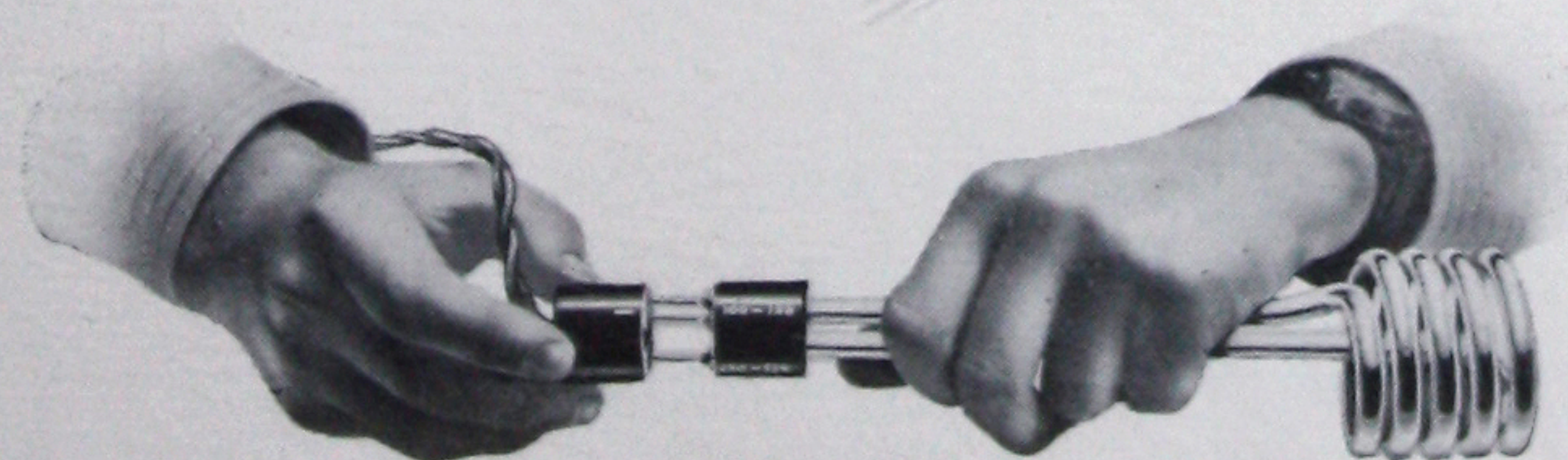
While neat enough for any room, its efficiency of 98% leaves no justification for the use of gas and coal heaters, which are also dirty, troublesome, inconvenient, and fume producing.

The "Genii" commences duty in the morning by boiling water for the first cup of tea. Shaving water is ready in thirty seconds, when the "Genii" can be put into the washhand jug. That takes only 8 to 10 minutes to acquire a temperature of 104° Fah. Some use occurs for it hourly; in a kettle or jug for Face Steaming, Bronchial Illness, or Shampooing; for the Hot Beverages or Cup of Soup on retiring at night, and the water for Dental use and Hot Water Bottles.

It is an Enduring Convenience for Travellers, Chemists, Doctors, Dentists, Hairdressers, Hospitals, Offices, Shops and Stores, and Everywhere in the Home from Kitchen to Nursery and Bedroom.

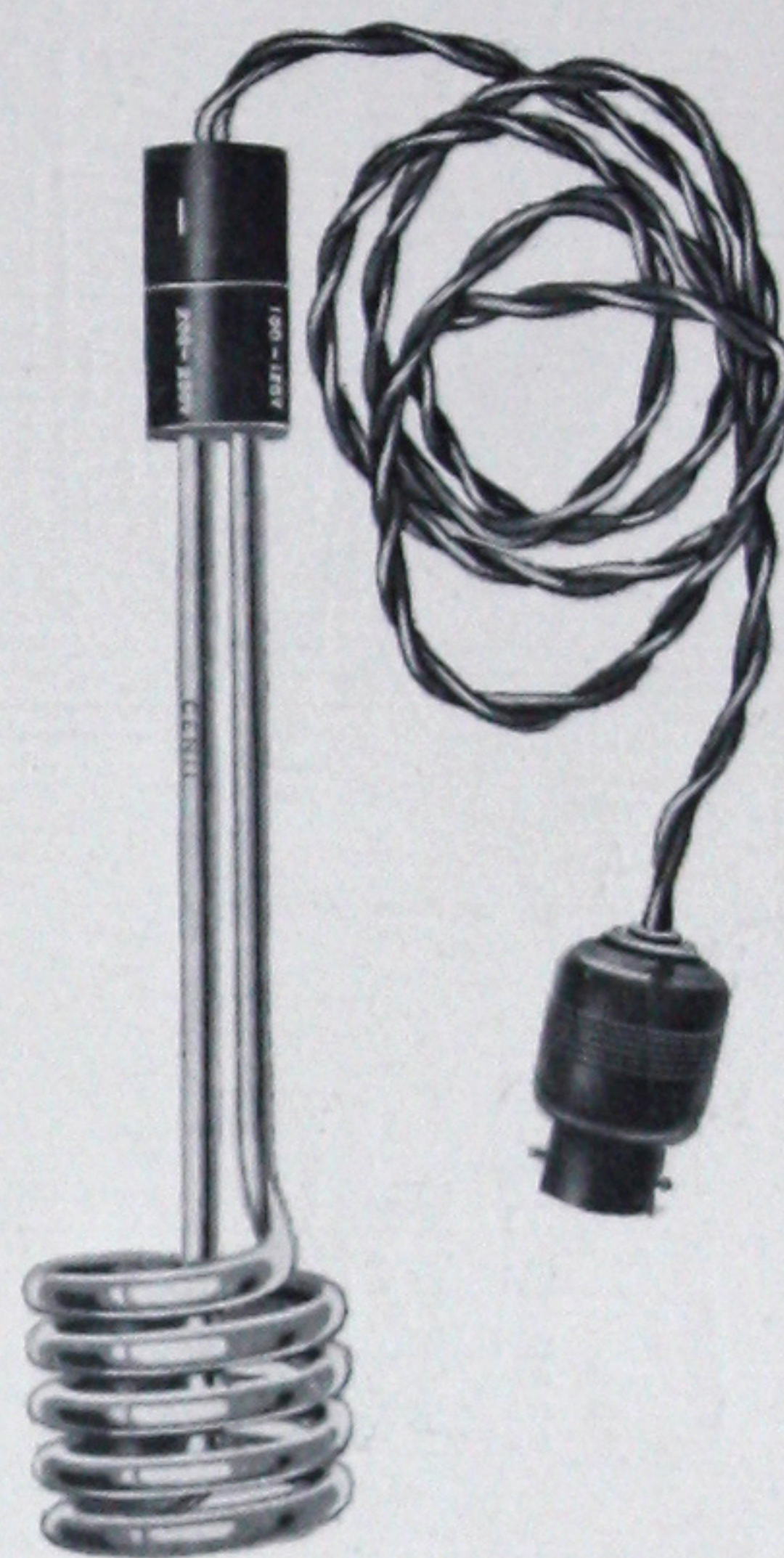
Silver kettles, jugs and articles of a decorative design, which have so far presented considerable difficulties in modifying to electric heating, require no adaption for the "Genii" Boiler which is simply inserted in them.

The "Genii" Electric Boiler is connected by a length of flexible cord to an adaptor inserted in an ordinary lamp holder.

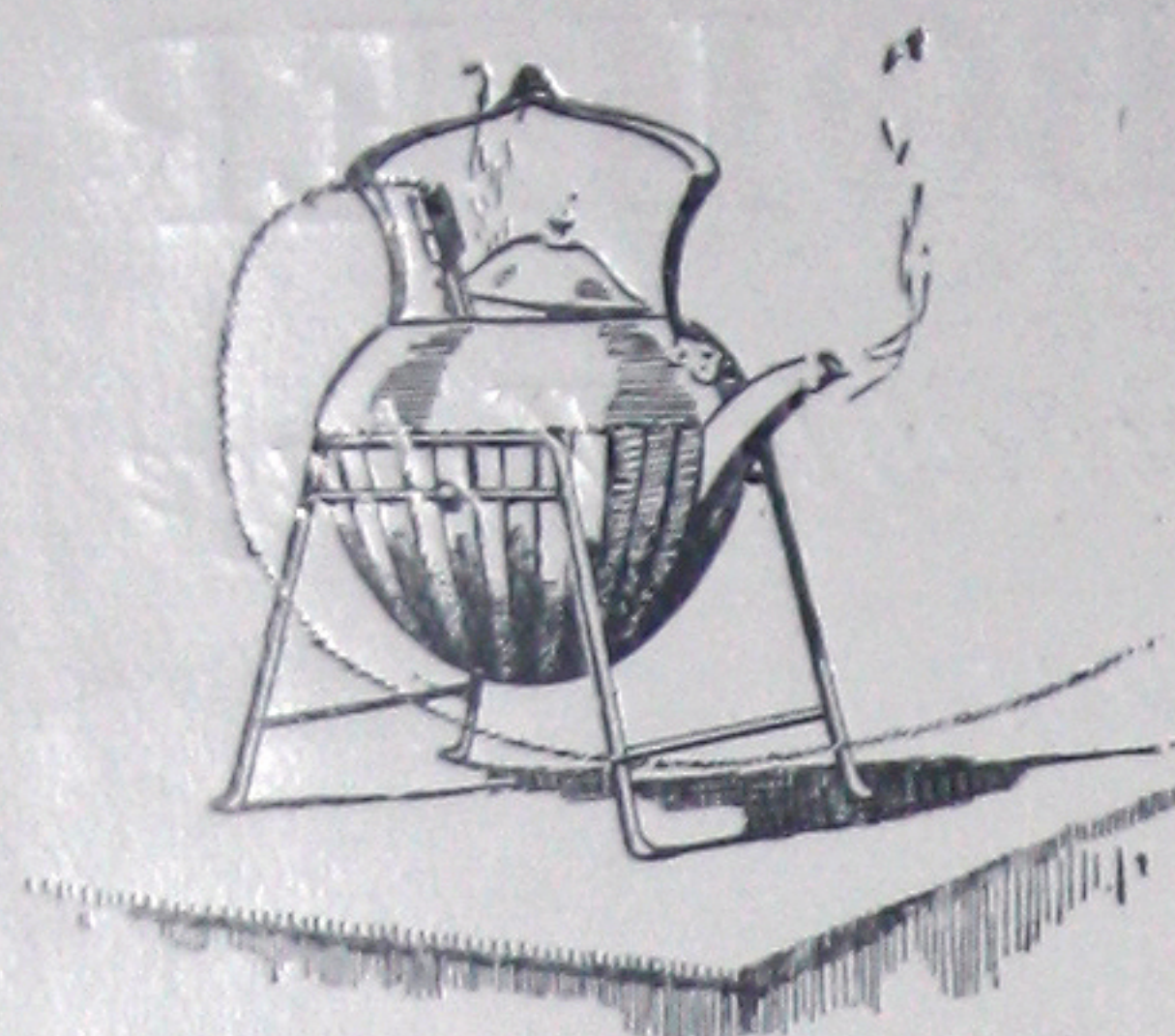


Setting to Required Voltage.

The coil is of seamless construction and continued without joint in the two straight and rigid tubes that enter the handle. There is consequently no

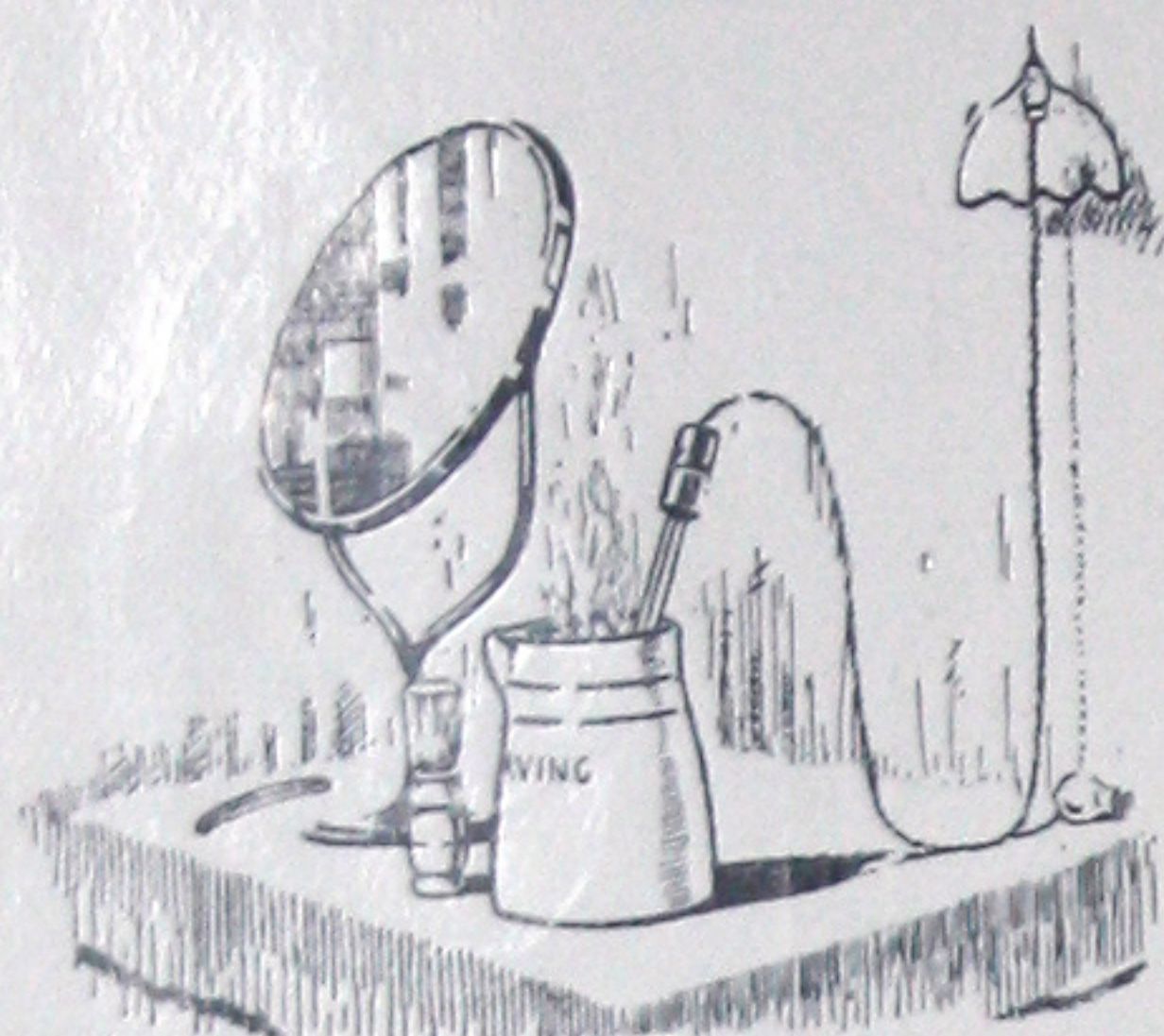


The heating element is contained in the coil part only which is submerged in the liquid, thus enabling the entire heat produced to be given up to the liquid in the smallest vessel. It will go in a cup with ease, being only $2\frac{1}{4}$ ins. dia.



soldered part to melt under the intensity of the heat and admit liquid to ruin the appliance, and the result is a practically indestructible article.

The actual surface radiating heat is 34 sq. ins., representing the bottom of a kettle $6\frac{1}{2}$ ins. in diameter, but it really equals twice as much, since the heat is applied within the liquid, and not merely beneath its receptacle.



The "Genii" Electric Boiler is made with extreme care, and only the best and most suitable materials are employed in its construction. Each one before leaving the works is tested at 500 volts and once in five run at full heat in air for 15 minutes. All these precautions ensure reliability and that the appliance is practically indestructible.

GUARANTEE.

Each Boiler is packed in an attractive carton suitable for sending through the parcel post. This should not be unsealed by the Retailer, as our guarantee does not cover misuse, running the Boiler when not covered by liquid, or connection at wrong voltage.



CODE AND CATALOGUE NUMBERS.

For Specified Voltages of 100-120 or 200-220 or 230-250 Volts		Fitted with change-over switch handle for use on 100-120 & 200-250 Volts	
Single Boilers	One dozen Boilers	Single Boilers	One dozen Boilers
Code No. 115	Code No. 116	Code No. 117	Code No. 118

Nett Weight (including flex and adaptor)	11 ozs. (312 grammes)
Overall Height $9\frac{3}{4}$ in. (25 cms.)	Length of Cable ... 6 feet (1.83 metres)
Outside diam. of Coil ... $2\frac{1}{4}$ in. (5.7 cms.)	Height of Coil 2 in. (5 cms.)
Current Consumption, 450—500 Watts in boiling 1 quart (1 litre) of water = 98% efficiency.	

If desired a "Heater Adaptor" can be supplied which enables both a boiler and lamp to be used from one lamp-holder—singly or at same time. (See Leaflet Y-207, page 3).

GEORGE NOBBS LTD.

Governing Director: G.G. Nobbs, M.I.E.E., M.I.H.V.E., ETC. Secretary: F.E. Nobbs.

Electrical Engineers & Manufacturers.
HEAD OFFICE,

89, CLEVELAND STREET,
FITZROY SQUARE, LONDON, W.1.

WORKS, LONDON & MANCHESTER.

TELEGRAMS:
"ELECTRISZ, EUSROAD"
LONDON.

TELEPHONE:
MUSEUM, 3455
Codes: A.B.C. 5th Edition.

"GENII"

ELECTRIC DISTILLERS

Recent Patents:—British, Nos. 12318/15, 18891/18, 160074, 153513.

U.S. Patent, No. 268310.

Others Pending.

All Rights Reserved.

"GENII" Electric Distillers are very efficient plants for water distillation and produce a chemically pure distillate. They are constructed on novel lines and no tubes for carrying the steam and cooling water are employed. They are furthermore designed to be automatic in action, the distillation process, once started, going on without any assistance until stopped.

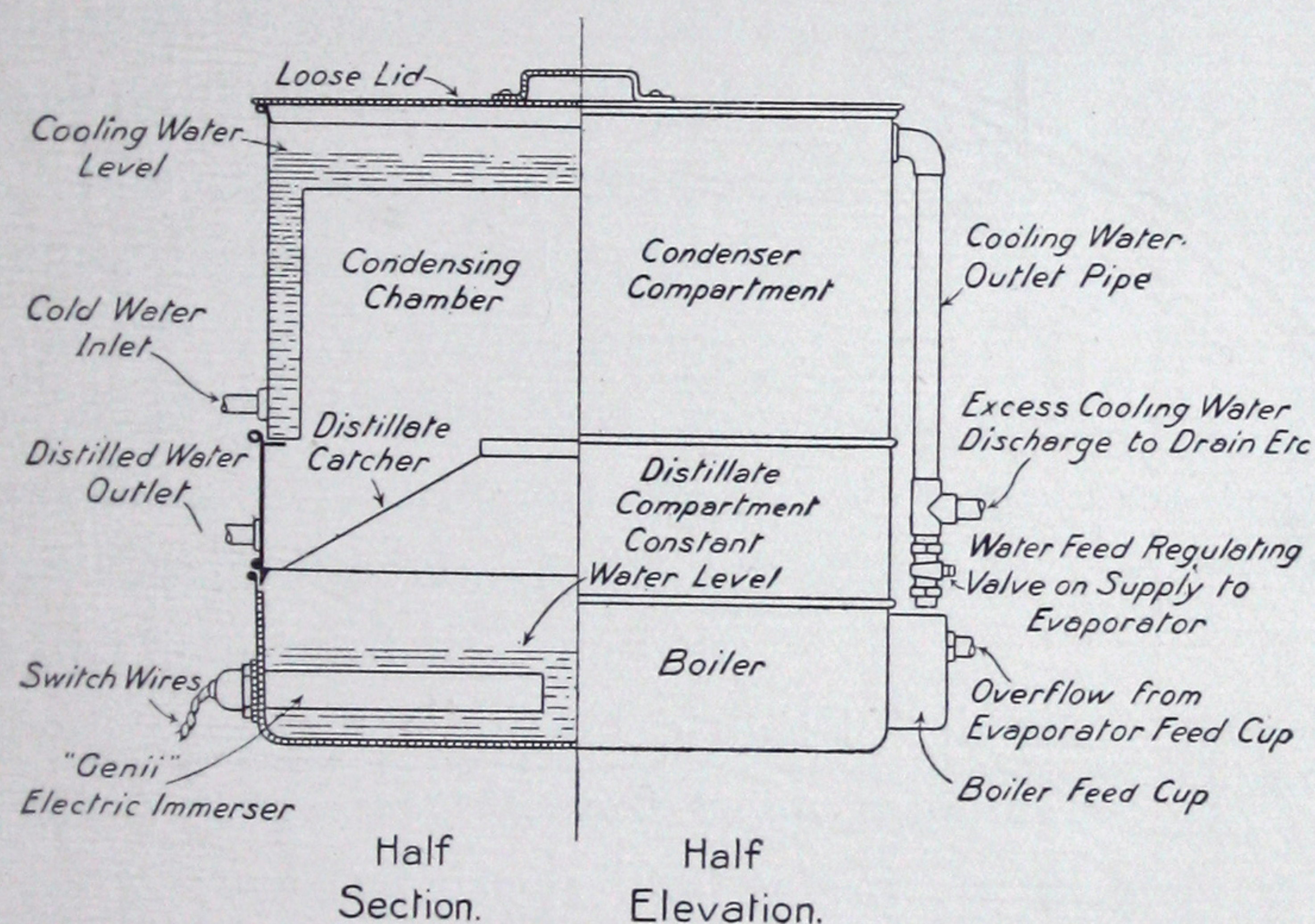


FIG. 1.

Fig. 1 illustrates principal features in the construction of "Genii" Distillers. It will be seen that it simply consists of three compartments arranged one above the other. The lowest contains the water to be distilled and the appropriate number of

"Genii" Immersion Heaters for boiling water at the required rate. The top compartment, which is cooled by a water jacket, condenses the steam and the distillate is caught on the sloping surfaces of the centre compartment and is drawn off through the outlet pipe provided. It will be noticed that the cooling water outlet pipe is arranged to supply fresh water to the lowest or evaporating compartment through a regulating valve. By correctly adjusting this valve, the level of the water in the lowest compartment can be kept constant, thereby rendering the apparatus automatic in its action. Particular attention is also drawn to the complete absence of coils of tubes or worms, commonly found in other distillers, making frequent cleaning



FIG. 2.

necessary on account of the rapid choking of the tubes or worms.

"Genii" Distillers are constructed of copper, polished outside and tinned inside and fitted with copper and brass fittings.

The "Genii" Electric Distiller has many advantages.

It is easily installed, chemically pure distilled water is made only as and when required. There is no handling of carboys. The current consumption is only 4 units per gallon of distilled water, consequently where the cost of electricity is reasonably low, the price per gallon of distilled water is less than that charged for it in carboys.

In one case, the installation of "Genii" Electric Distillers for Substations effected a clear saving of £720 per annum *apart from the saving of hauling charges, incidental to taking delivery of, storing and returning empty carboys*. In addition, "Genii" Electric Distillers give in the outflowing cooling water, a very considerable supply of nearly boiling water, part of which feeds the evaporator, the balance being available for hot water purposes, or can be re-used in the stills after cooling, thereby reducing the amount of furr deposited to a minimum. Four standard sizes are available, having distilled water outputs of $\frac{1}{2}$, 1, 2, and 4 gallons per hour. The first three are rectangular in shape and the last cylindrical. Distillers of other capacities will be manufactured on receipt of requirements.

If, however, 4 or more than 4 gallons of distilled water per hour are required, we recommend a multiple unit installation. For example, for an output of 4 gallons per hour, two 2-gallon stills are better than one 4-gallon, equally for 16 gallons per hour, four 4-gallon stills make a very good arrangement.

The multiple unit installation is no higher initial outlay, and costs no more to run. It has, however, the great advantages that the stills can be cleaned in turn, when the full output of distillate is not required.

All Stills can be arranged for steam, gas or oil operation if required.

"Genii" Electric Stills are of great value in Power Stations, Sub-stations, Storage Battery Installations, Charging Stations, Country Houses, Chemical Works, Breweries, Hospitals, Laboratories, Mineral Water Plants, Ice Making Plants, Photographic Works, Small Steamships and Yachts, and for obtaining pure drinking water from a salt or contaminated supply.

Pure distilled water is in every way to be recommended for drinking purposes as compared to ordinary tap water, in as much that it is entirely free from impurities or water-borne diseases.

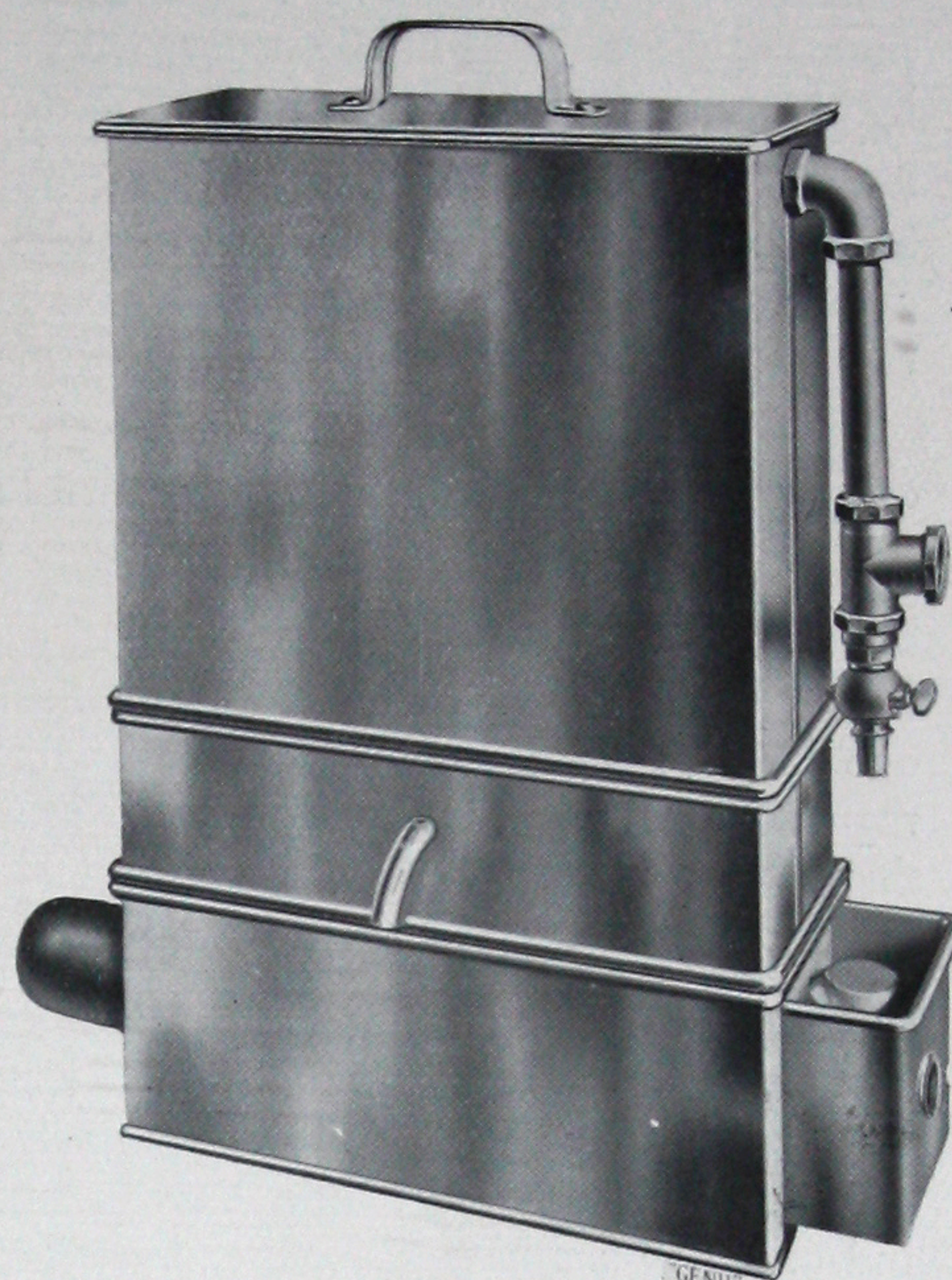


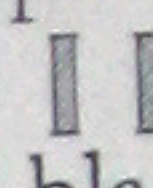
FIG. 3.

Catalogue & Code No.	Output	Loading	Dimensions	Weight	Packing Case Dimensions Weight	Shape of Distiller	
200	$\frac{1}{2}$ gal. per hour (2.3 litres)	2 kW. 1 "Genii" 2 kW. Immerser	12in. x 5in. x 18in. high (31 x 13 x 46 cms.)	18 lbs. (8 kg.)	1.7 cu. ft. (0.05 cu. m.)	36 lbs. (16 kg.)	Rectangular
201	1 gal. per hour (4.5 litres)	4 kW. 2 "Genii" 2 kW. Immersers	21in. x 9in. x 20in. high (54 x 23 x 51 cms.)	33 lbs. (15 kg.)	4.0 cu. ft. (0.11 cu. m.)	60 lbs. (28 kg.)	Rectangular
202	2 gals. per hour (9.1 litres)	8 kW. 4 "Genii" 2 kW. Immersers	23in. x 15in. x 23in. high (59 x 38 x 59 cms.)	60 lbs. (27 kg.)	7 cu. ft. (0.2 cu. m.)	120 lbs. (54 kg.)	Rectangular
204	4 gals. per hour (18.2 litres)	16 kW. 8 "Genii" 2 kW. Immersers	30in. dia. x 37in. high (76 x 94 cms.)	125lbs. (57 kg.)	20 cu. ft. (.57 cu. m.)	$2\frac{1}{2}$ 2 cwt. (127 kg.)	Cylindrical

Made for standard pressures of 50 to 500 volts, suitable for AC and DC circuits.

"GENII" ELECTRIC STILLS. Fixing and Working Instructions.

1. See that the Still stands on a level foundation, otherwise some of the electric heaters may not be sufficiently immersed in the water, with consequent danger of burning out. This can be checked by observing the water level in the boiling chamber when setting up the Still.

- 1a. IMMERSION HEATERS.—If not already in position, screw the Immersion Heaters into the bosses provided in the boiler pan to make water tight with graphite or the usual red lead joint, be careful to see that the immerser blades are set upright—thus —not flat or at an angle—then the water circulates freely and risk of overheating the heater blades is obviated.

Connect the immerser terminals to a suitable source of electricity supply through flexible cable and tubing—watertight—to control switches and fuses mounted adjacent to the Distiller plant.

"EARTH" the Still efficiently by separate cable if the cold water connection is not a good metallic "earth" connection.

NOTE.—When "GENII" Stills are fitted with immersers each having three terminals, one terminal is the common pole and the other two terminals are for two heats. If two heat regulation is not required on each immerser, the two heat terminals can be "bridged" for single heat working.

Each heater blade is wound for parallel working on low pressures up to 250 volts.

2. Cold water from a large storage tank or source of CONSTANT supply must be laid on to the inlet boss provided for same near bottom of condensing (upper) compartment. The cold water supply should be fitted with a fullway stop valve for regulating the cold water feed and the connection between Still and C.W. Stop Valve should preferably be made with flexible tubing or hose pipe and union to facilitate dis-connection when taking the Still apart for cleaning or examination.
3. In order to ensure a constant head of cold water, it is preferable to take this supply from a large storage tank rather than direct from Water Company's Mains where the pressure in the latter is liable to vary at various times of the day. If a constant head or pressure of cold water is maintained, the C.W. regulating valve will not require altering when once set.
4. The C.W. Storage Tank (if such is used) must be at such height above the Still as will ensure a regular delivery of at least 8 to 10 times the rated capacity of the Still.
5. Overflow pipes—preferably with union connection to facilitate dismantling when required—to be connected to the outlets provided to the cooling water discharge pipe and the filling cup of boiling compartment. The overflow water will be at a temperature of 160° F. to 190° F., and consequently should be turned to advantageous use where hot water is required for any purpose or may be cooled and reused through the still and thus reduce fur deposit to a minimum.
6. Make sure that the overflow from filling cup on the side of the boiling compartment maintains about $\frac{3}{4}$ of an inch of water above the electric heaters when cold.
7. Regulate the cooling water inlet valve so that the temperature of the overflow does not exceed 200° F.
8. When the Still has been working some minutes the distilled water will begin to be discharged. The cooling water discharge will also rise in temperature and should eventually reach a temperature of 190° to 200° F. The Still will work at its maximum efficiency when the cooling water is discharged at about these temperatures, which may be effected by regulating the C.W. Supply.
9. Before switching on current, make sure the electric heaters are covered with water by observing that water in filling cup stands at level of overflow.
10. Examine from time to time and clean off "furr" if necessary from the electric heaters, the holes at bottom of filling cup leading into boiling compartment, and the pipes and valves attached to the Still.

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TELEPHONE:
MUSEUM, 3455
Codes: A.B.C. 5th Edition.

“GENII P.S.” (Push System) WATER HEATERS

WALL OR BULKHEAD MODELS

Suitable for mounting over lavatory basins, sinks, etc.

Patent Nos. : British, 12318/15, 127496, 160074, 153513, 2489/14.
U.S.A., 268310. Other patents pending.

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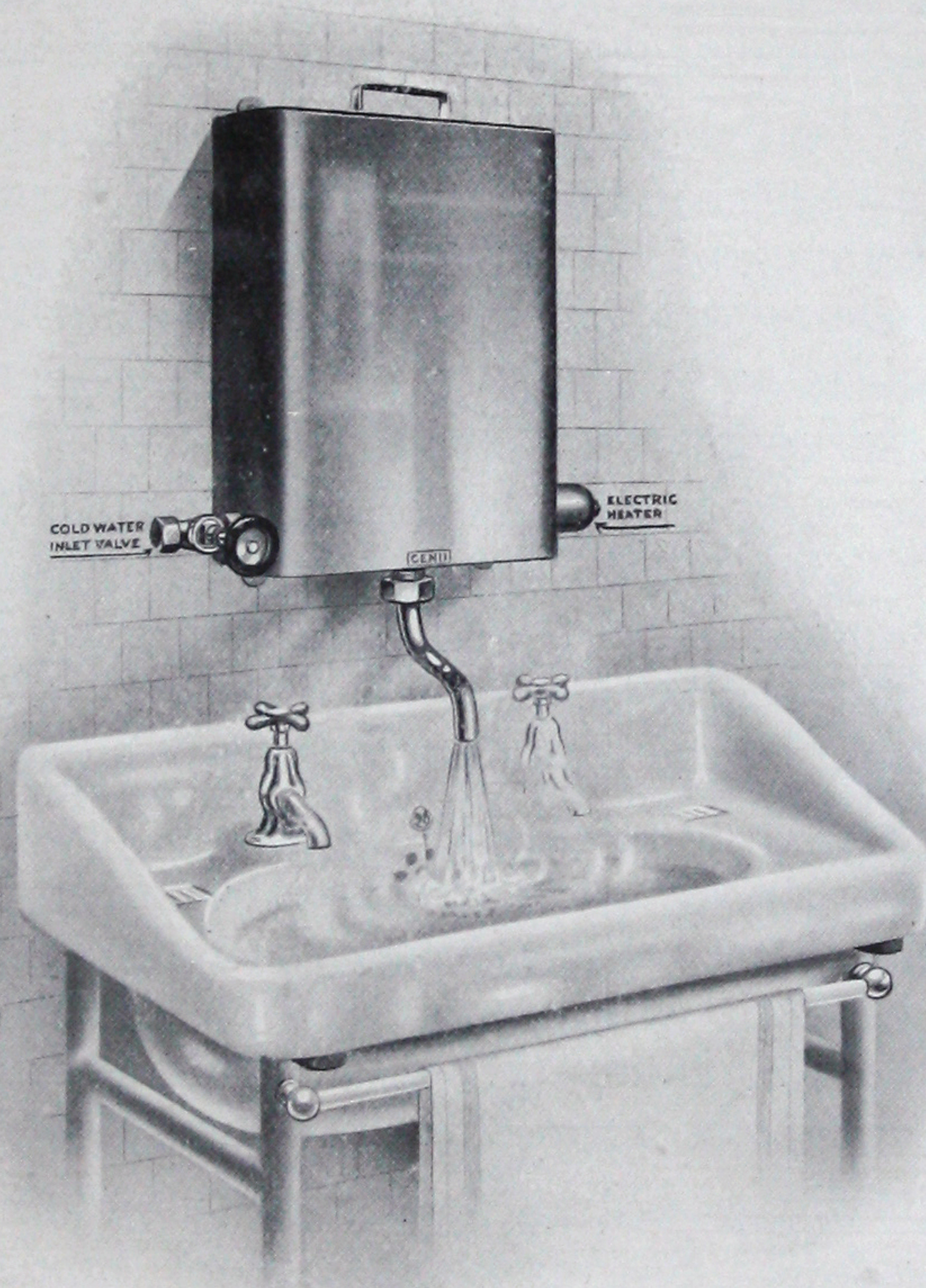


FIG. 1.

IN the Genii “P.S.” system of water heating it is a very simple matter to install a water heater just where the hot water supply is required. In the arrangement shewn in Fig. 1, the heater is placed immediately over a lavatory basin ; similarly, a heater may be fitted over a scullery sink or bath.

The water valve is fitted on the cold water side of the “P.S.” Heater. This has several advantages. The heater cannot be subjected to the pressure of the water mains. No air or steam vent is necessary, nor can any steam pressure be set up in the tank. The heater tank can be of light construction

and fitted with a loose cover. Thus the apparatus is LIGHT, SIMPLE AND SAFE.

This heater is supplied in various sizes to give any desired hot water storage capacity. Further, each size is available with different wattage immersion heaters so that any required quantity of hot water can be obtained. The models dealt with in this section range from 10 pints to 10 gallons in capacity, while larger sizes are dealt with in Catalogue Section Y.205.

With "P.S." type water heaters not only is the hot water stored just where it is required for use, but a very large saving in pipe work is effected, as the only water connection required is that to the nearest cold water supply pipe. But even where existing hot water pipe lines are run, "P.S." type heaters can be usefully installed because they eliminate the heavy heat losses in the pipes.

Further, should the amount of hot water required daily exceed that originally allowed for, it is an easy matter to speed up the supply by changing the existing immersion heater for one of larger wattage. These immersion heaters are available in a large number of sizes which are interchangeable in certain groups. For details, see tables in Catalogue Section Y.201.

It is usual to load these heaters lightly and keep the current flowing continuously or at "off peak" times during the day or night. This arrangement has two big advantages; one, that no special wiring is necessary, and two, that very advantageous rates for electricity can usually be obtained.

To supply hot water at a faster rate for emergency periods, a three heat immersion heater and switch can be fitted.

With heaters on *continuous light loading* as just described, satisfactory service depends entirely on a relatively small supply of hot water being required at any one time. Hot water will then be available at any time of the day or night. Obviously, if the whole hot water contents of the tank are withdrawn, a rather long period must elapse before really hot water will again be available.

Where it is desired to have large supplies of hot water at comparatively short notice, it is necessary to select water heaters with high current loadings, or of the requisite hot water storage capacity. Requirements in the home for most purposes can be dealt with adequately by the range of models A, B, C and D, detailed on the back page. Heaters of 10 gallons capacity and upwards can be supplied in cylindrical form and are described in a separate section.

The chart in Fig. 2 will be found useful for determining the size of immersion heater required for various hot water supplies.

For example, to find the supply of hot water at scullery sink temperature (160°F) available with a given wattage immersion heater, run the eye along the horizontal line at 160°F and read off on the gallons per hour scale the point where it intersects the given wattage curve in the chart. In this way the gallons of hot water at 160°F with 250 watt heater is shown to be $\frac{3}{4}$ -gallon per hour; with 500 watt, $1\frac{1}{2}$ gallons per hour; with 1,000 watt, 3 gallons per hour; and so on.

Again, to obtain five gallons of water in twenty minutes for bath purposes, we must start from the 15 gallons per hour point on the lower scale and raise the eye to the level of the bath temperature line (110°F). Here we arrive about half-way between the 2,000 watt line and the 3,000 watt line. Consequently, a 2,500 watt heater would be suitable; alternately

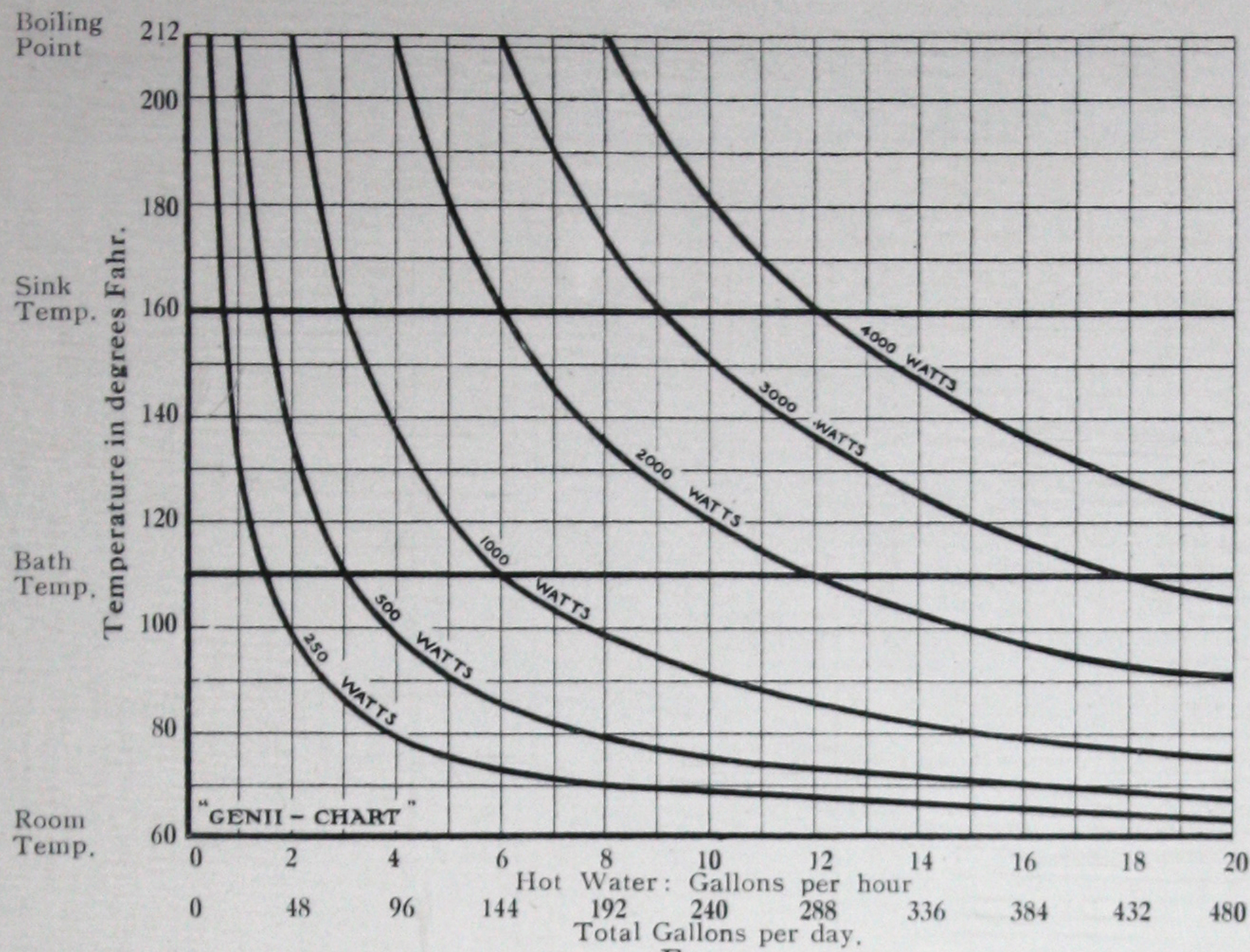


FIG. 2.

$\frac{3}{4}$ -gallons of hot water per hour for sink purposes and would therefore heat up a type "A" tank (10 pints, $1\frac{1}{4}$ gallons) in 1 hour, 40 minutes.

The chart given is based on an average efficiency of 88 per cent., which is the average efficiency obtained in practice. The efficiency increases up to as much as 95 per cent. when a high loading is used with a small size tank, and falls to about 75 per cent. when a low loading is used with a large tank. Consequently, in the former case rather more hot water would be available than is shown, and in the latter case rather less.

A little practice will make this chart very useful indeed.

In Catalogue Section Y.200 will be found useful information on these matters and simple formulæ are there given for making calculations connecting kilowatts, gallons of water, and time in hours.

The simple principle of the Genii "P.S." heater is shown diagrammatically in Fig. 3. On opening the cold water inlet valve, cold water enters at the bottom of the tank. This pushes the hot water through the internal overflow pipe and out at the hot water nozzle. The cold water does not mix with the hot water but pushes it before it. Nothing could be simpler or more certain.

Genii "P.S." heaters are constructed of copper tinned inside, and with polished copper or nickel plated finish outside. These attractive finishes obviate the need for lagging (which is liable to promote insanitary conditions) and add considerably to the smart appearance of the apparatus.

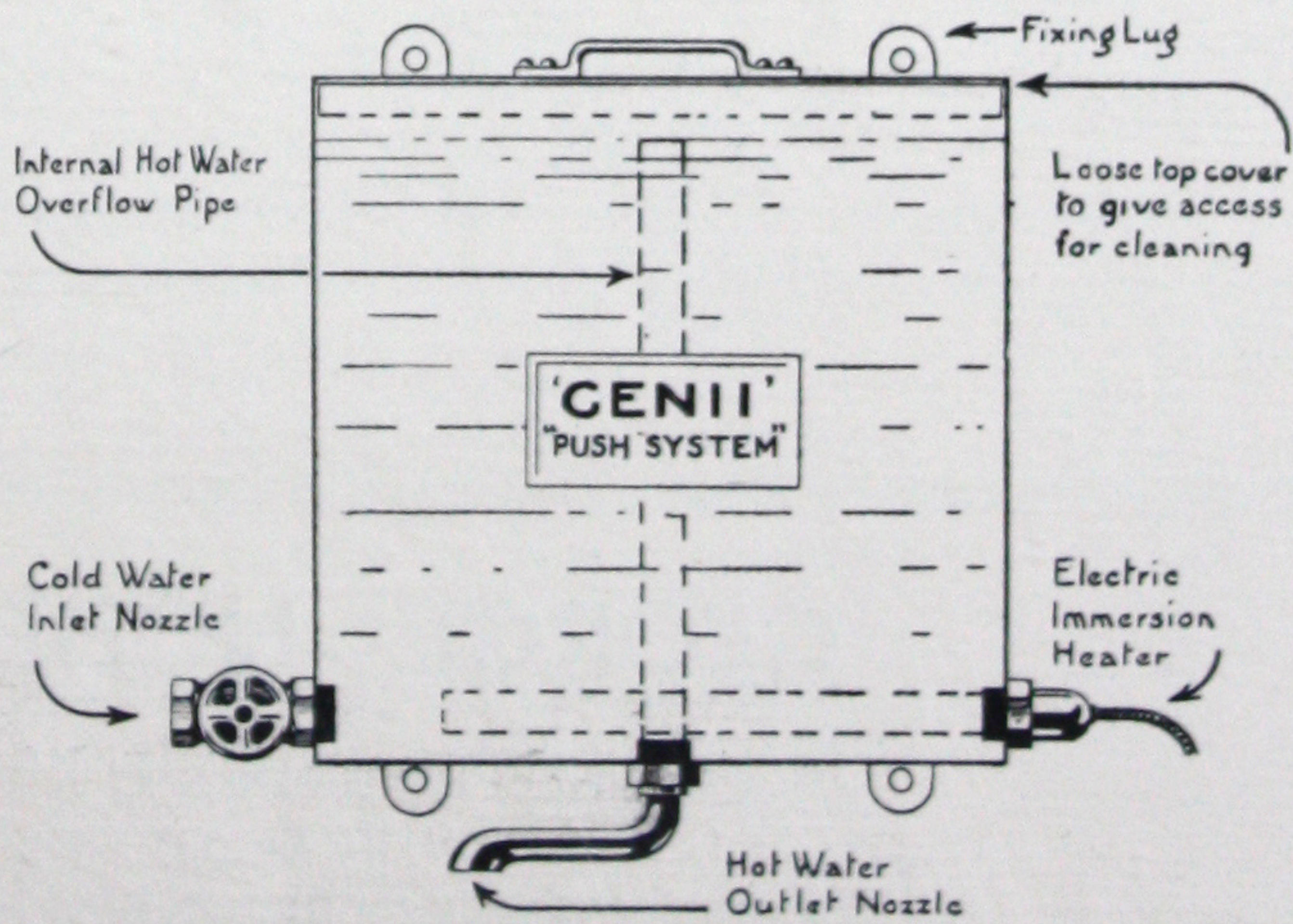


FIG. 3.

a 3,000 watt heater would give us the supply at the rather higher temperature of 120°F , or the 2,000 watt heater at only 100°F .

Knowing the gallons per hour available at any required temperature with a given watt-age heater, it is easy to calculate how long it will require to heat up the whole contents of the tank. That is, a 500 watt heater gives

Approximate particulars of Standard Sizes of "Genii P.S." type Water Heaters.
Wall Patterns A, B, C, and D.

WALL Pattern	Code & Catalogue No.			Watts Max.	Quantity of Water per hour raised		Height		Width		Projection		Weight	
	Polish'd Copper Finish	Nickel Plated Finish	Immerser only		50° F. Pints	30° C. Litres	ins.	cms.	ins.	cms.	ins.	cms.	lbs.	kg.
"A" 10 pint capacity 5.68 litres	210	211	101	100	4.0	3.8	12	30.5	7	17.8	4	10.5	7.23	3.28
	212	213	107	250	11.6	6.1							7.45	3.37
	214	215	109	500	25.0	13.0							7.60	3.43
	216	217	120	500R	25.	13.							8.20	3.72
	218	219	122	750R	38.	20.							8.35	3.72
	220	221	126	1000R	53.	28.							8.50	3.73
	222	223	2/126	2000R	107.	56.							11.20	5.00
													9.0	4.08
"B" 20 pint capacity 11.36 litres	224	225	101	100	3.5	1.85	15	38	12	30.5	4	10.5	9.22	4.17
	226	227	107	250	9.8	5.15							9.37	4.23
	228	229	109	500	23.	12.0							9.5	4.3
	230	231	111	750	36.	19.							9.7	4.4
	232	233	113	1000	50.	26.							10.0	4.5
	234	235	120	500R	23.	12.							10.0	4.5
	236	237	122	750R	36.	19.							10.2	4.6
	238	239	126	1000R	50.	26.							10.3	4.7
	240	241	130	1500R	76.	40.							11.9	5.4
	242	243	132	2000R	104.	54.							15.3	7.0
	244	245	2/132	4000R	212.	112.							18.9	8.5
	246	247	3/132	6000R	321.	170.								
"C" 5 gallon capacity 22.7 litres	250	251	107	250	6.8	3.5	16	40.5	16	40.5	6	15	12.6	5.7
	252	253	120	500R	20.	10.5							14.0	6.3
	254	255	122	750R	32.	17.0							15.5	7.0
	256	257	124	1000R	45.	24.0							15.5	7.0
	258	259	128	1500R	72.	37.5							17.2	7.8
	260	261	132	2000R	99.	52.0							17.6	8.0
	262	263	134	2500R	126.	66.							18.0	8.1
	264	265	136	3000R	154.	81.							21.2	9.5
	266	267	2/132	4000R	208.	109.							25.2	11.3
	268	269	3/132	6000R	316.	166.								
"D" 10 gallon capacity 45.5 litres	270	271	107	250	5.5	2.85	21	53.5	18	46.0	8	20.5	15.5	7.0
	272	273	120	500R	18.0	9.3							17.0	7.7
	274	275	122	750R	30.	16.0							17.0	7.7
	276	277	124	1000R	43.	22.5							17.0	7.7
	278	279	128	1500R	70.	37.0							17.6	8.0
	280	281	132	2000R	98.	51.							20.0	9.0
	282	283	134	2500R	124.	65.							20.4	9.3
	284	285	136	3000R	152.	80.							21.0	9.5
	286	287	2/132	4000R	206.	108.							23.5	10.6
	288	289	3/132	6000R	314.	165.							27.5	12.5

HEAT REGULATION SWITCH SETS may be fitted to the heaters marked R in the fifth column of table. For particulars and code numbers see Leaflet Y201.

SPECIAL SIZES. "P.S." Water Heaters of sizes and wattage other than the above standard models, can be made to suit specific requirements.

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WORKS, LONDON & MANCHESTER

"GENII" WARMING PLATES

Foot Warmers. Bed Warmers. Towel & Gown Rails



"GENII" Warming Plates consume very little electricity and may be connected to the ordinary lighting circuit.

They are excellent for keeping food, beverages, dishes, etc., hot until served, and are invaluable in the Nursery, Bedroom, Sick Rooms, Service Rooms, for Hotels, Clubs, Restaurants, etc.

"Genii" Warming Plates are of special rustless construction, well built and have a long life. The table top is of solid aluminium with a dull silvered finish. The heating compartment is immediately below the table top and is made of steel with a sherardised rustless finish. Heat insulating handles with nickel plated supports are provided at each end, and the whole is supported by ebonised wood insulating feet. The heating elements are so disposed as to give uniform heating to the table top. Solid connections are used to the service terminals. The elements are easily accessible, making renewals or exchange of voltage a simple matter. With normal use the elements will last for many years. The insulation is mica throughout, no asbestos or moisture absorbing materials being used.

Code No. and Catalogue No.	Size.	Watts (approx.)	Weight.	Shipping details for cases of six.	
				Case Dimensions.	Wt of Case.
450	18ins. x 12ins. (45 x 30 cms.)	250	10 lbs. (4.5 kg.)	24ins. x 15ins. x 28ins. (60 x 38 x 70cms.)	125 lbs. (57 kg.)
452	24ins. x 12ins. (60 x 30 cms.)	330	12 lbs. (5.5 kg.)	30ins. x 15ins. x 28ins. (75 x 38 x 70cms.)	142lbs. (65 kg.)
454	24ins. x 18ins. (60 x 45 cms.)	500	18 lbs. (8.0 kg.)	30ins. x 21ins. x 28ins. (75 x 53 x 70 cms.)	190 lbs. (86 kg.)
456	36ins. x 18ins. (90 x 45 cms.)	750	22 lbs. (10 kg.)	42ins. x 21ins. x 28ins. (105 x 53 x 70 cms.)	310 lbs. (140 kg.)
458	Sample Shipment consisting of 2 No. 450, 2 No. 432, 2 No. 454, and 6 No. 456 in one case.			42ins. x 42ins. x 28ins. (105 x 105 x 70 cms.)	510 lbs. (230 kg.)

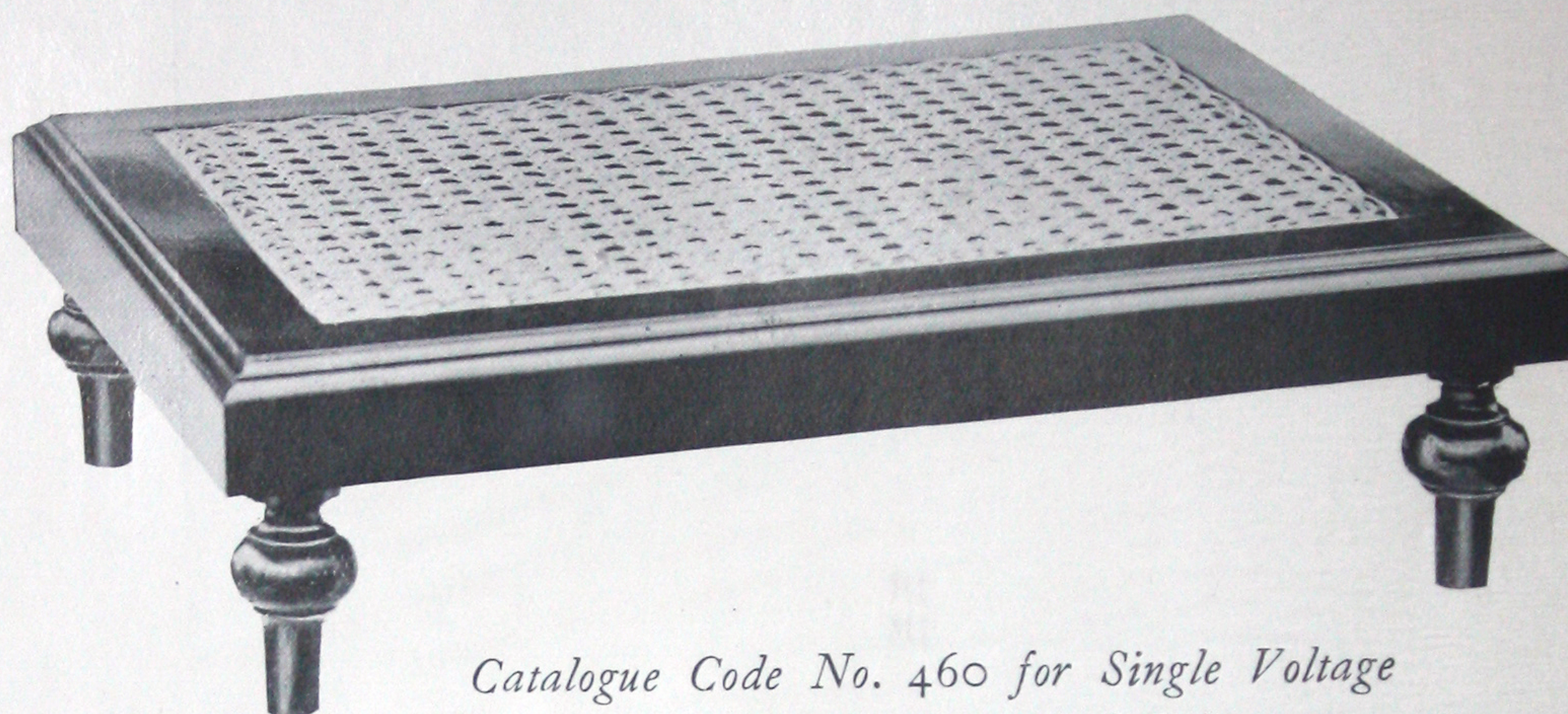
Made for any circuit of 25 to 250 volts.

Orders should state the voltage required.

Switches may be fitted if required.

"GENII" FOOT WARMERS

Made for any Single Voltage or Universal
Voltages of 100 to 250 Volts



*Catalogue Code No. 460 for Single Voltage
or No. 462 for Universal Voltage.*

"GENII" Electric Foot Warmers are well made, with polished solid mahogany framing, and best quality woven cane panels. The heating unit consists of four detachable "Genii" standard mica strip type heating elements having low temperature windings. The elements are secured and clamped with solid nickel connection strips to a steel frame by bolts and nuts and then protected by a detachable brass wire grid mounted underneath the framing. Every "Genii" Foot Warmer is supplied complete with 3 yards (3 metres) flexible cord and lamp socket adaptor.

Consumption is only one tenth of a unit per hour and they may therefore be used on the ordinary lighting circuit

CODE AND CATALOGUE NUMBERS.

For any specified circuit of 25-250 Volts.		Fitted with change - over switch for use on Universal Voltage, 100-120 and 200-250 Volts.	
Single Warmer.	Case of Six.	Single Warmer.	Case of Six.
460	461	462	463

LOADING IN WATTS: 100 approx.

WEIGHT (nett): 5 lbs. (2.26 kg.)

SIZE: $18\frac{1}{2}$ x $13\frac{1}{2}$ x $5\frac{1}{2}$ ins. high (47 x 34 x 14 cms.)

GROSS WEIGHT AND CUBAGE FOR CASE OF 6: 65 lbs. and $4\frac{1}{4}$ cubic feet (13. kg. and .120 cu. metres.)

"GENII" BED WARMERS

FOR THE HOME AND TRAVELLING



"GENII" Bed Warmers are essentially "Safety First" bed warmers. Users of "Genii" Bed Warmers can be confident that there is absolutely no danger of fire or burns, as has been known to occur with inferior makes. The "Genii" Bed Warmer consists of a polished cylindrical copper container, corrugated to increase radiation.

The elements, which are lightly loaded of the mica wound strip type, are inserted through the neck of the container and are easily *replaceable* if ever necessary. The elements are connected through 6 yards ($5\frac{1}{2}$ metres) of flexible, to a lamp holder adaptor. "Genii" Bed Warmers are loaded to approximately 20 to 30 watts, that is to say, about one unit of electricity is consumed for every 40 hours use. Because "Genii" Bed Warmers are guaranteed to be absolutely safe, they can be used with confidence in hospitals, private nursing institutions, the home, by the aged, sick and children.

CODE AND CATALOGUE NUMBERS.

For any specified circuit of 25-250 Volts.		Fitted with change-over switch for use on Universal Voltage, 100-120 and 200-250 Volts.	
Single Warmer.	Case of Twelve.	Single Warmer.	Cases of Twelve.
464	465	466	467

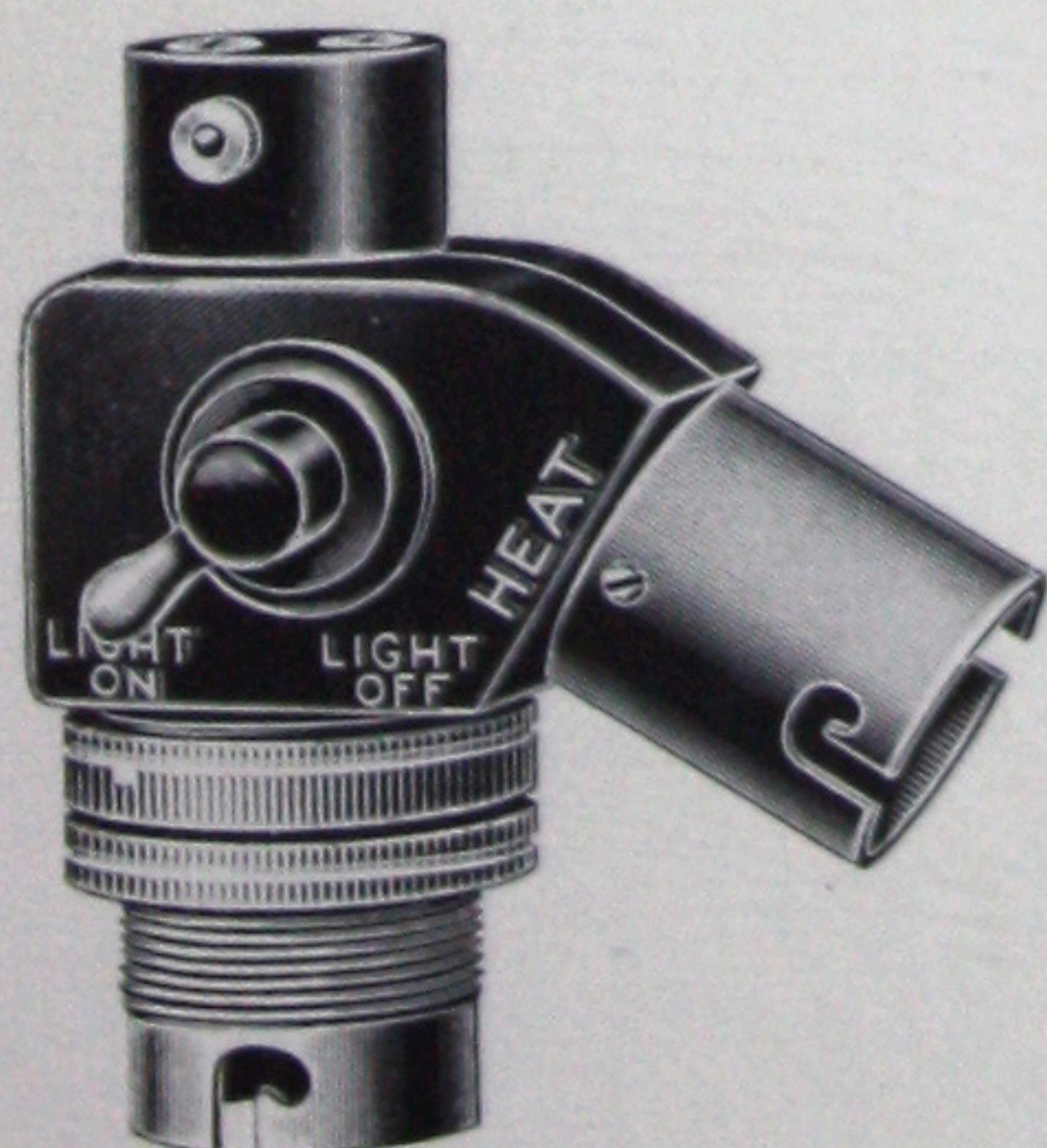
LOADING IN WATTS: 25-30 approx.

WEIGHT (nett): 2.2 lbs. (1 kg.)

SIZE: $4\frac{1}{2}$ ins. diameter x 11 ins. (11 cms. diameter x 28 cms.)

GROSS WEIGHT AND CUBAGE FOR CASE OF 12: 56 lbs. and $3\frac{1}{4}$ cubic feet (13.16 kg. and .092 cu. metres.)

HEATER ADAPTOR

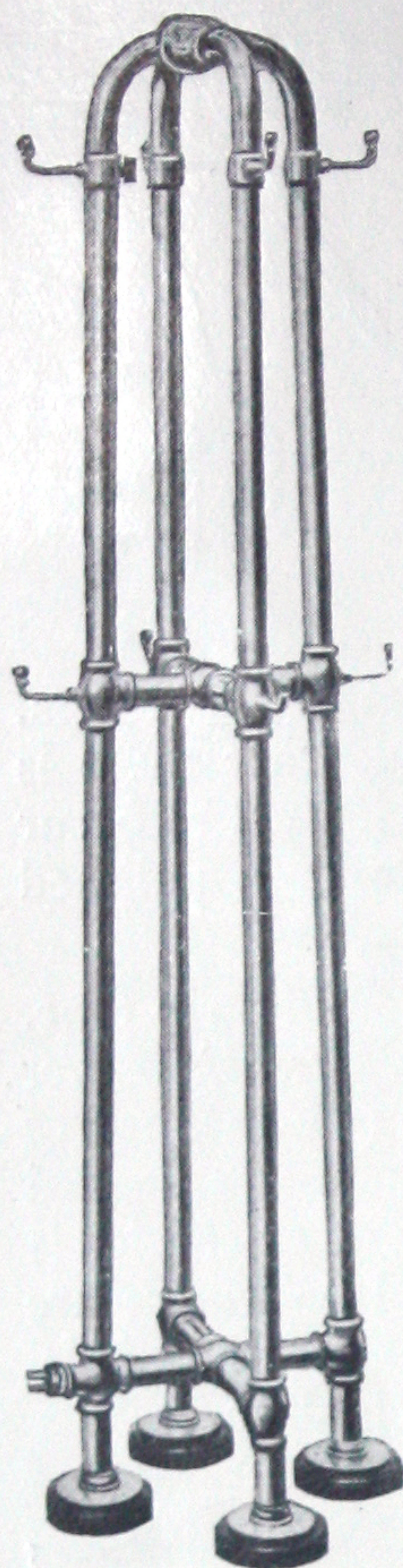


THIS Heater Adaptor is a fitting which may be inserted in an ordinary lampholder so that the lamp which it takes the place of, occupies a position in the Adaptor, and a further socket is provided for the "Genii" Bed Warmer or other heater, etc. Both get full voltage and the lamp may be switched off on the Adaptor without interfering with the Bed-Warmer.

This Adaptor does not cast a shadow.

CODE NUMBER 46

"GENII" TOWEL & GOWN RAILS

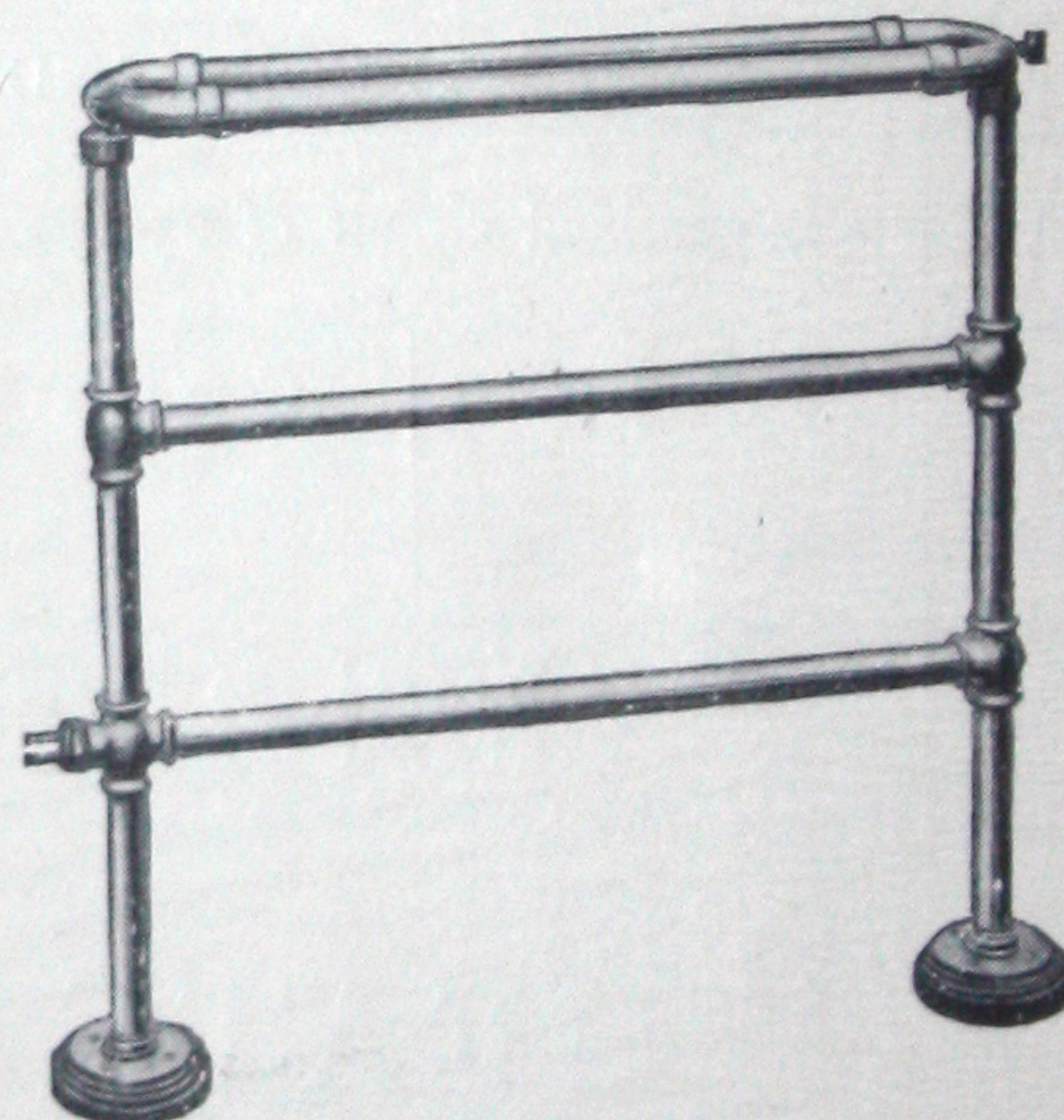


"GENII" Towel and Gown Rails compare very favourably with those served from an ordinary hot water system. With the "Genii" Rails the temperature instead of alternating between being too hot or too cold as in the ordinary type, is absolutely constant. There is no risk of fire or scorching. From an installation point of view, "Genii" Rails have a great advantage, as no pipe lines are required—only a flexible lead to the nearest lampholder or wall socket. "Genii" Towel or Gown Rails are constructed of heavy gauge seamless copper tubing with beaded gun metal fittings and tested to 50 lbs. per square inch pressure. They are supported on floor plates with black enamelled wood base blocks. "Genii" Rails are highly polished and nickel-plated throughout, and the heavy gauge tubing employed prevents damage by dents or kinks.

The heating is effected by Standard "Genii" immersers. A gunmetal water filler and relief valve is provided. To install the rails, fill them with water to the level of the filler-cup; then screw it down pressure tight. On switching on, the heat generated causes the hot water to circulate by gravity. As these rails lose but little water, a cupful added every few months is sufficient.

TOWEL RAIL.		GOWN RAIL.
Code No.	468	469
Watts ...	250	500
Size ...	36ins. x 36ins. high x 6ins. across top rails (92 x 92 x 16 cms.)	6ft. high x 14ins. square (183 x 36 cms.)

*Made for any pressure of 25 to 250 volts.
Orders must state the voltage required.*



GEORGE NOBBS LTD.

Governing Director: C.G. Nobbs, M.I.E.E., M.I.H.V.E., ETC. Secretary: F.E. Nobbs.

Electrical Engineers & Manufacturers.

HEAD OFFICE,

89, CLEVELAND STREET,
FITZROY SQUARE, LONDON, W.1.

WORKS, LONDON & MANCHESTER.

TELEGRAMS:
"ELECTRISZ. EUSROAD"
LONDON.

TELEPHONE:
MUSEUM, 3455
Codes: A.B.C. 5th Edition.

"GENII" HOT WATER RADIATORS

Patent Nos.: British—12318/15, 18891/18, 150074 153513 and 104721/16.
United States America—268310. Others pending.

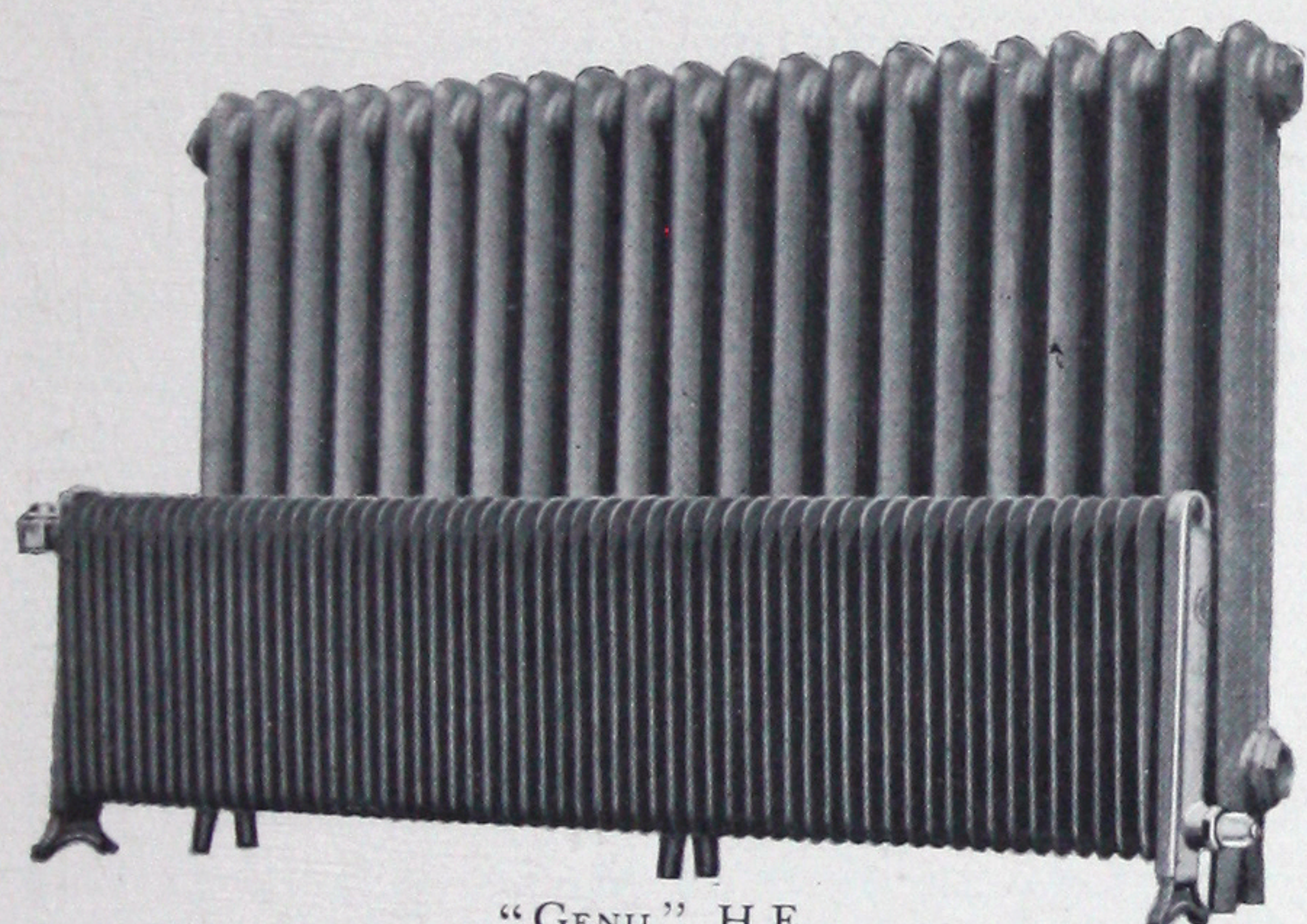
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THE "GENII" H.E. TYPE ELECTRIC HOT WATER RADIATOR

THE *ideal warming medium* is that of *hot water*, by which the heat is distributed over a large area of heating surface at a temperature varying from 130° to 185° Fahrenheit. Hot-wire Convectors, Fires, and Steam or Vapour Radiators have comparatively high working temperatures with the consequent "drying effect" of the air heated, causing a parched feeling in the throat and nose. A further important consideration is the height of the

radiator—the lower the height the greater is the efficiency for air warming.

Heat emission is proportional to the temperature difference. With a "tall and narrow" radiator, the upper part is enveloped in air already heated by the lower part, consequently the heat emitted from the upper part is less than the heat emitted from the lower half.



"GENII" H.E.
AND EQUIVALENT C.I. RADIATOR. "GENII"

Quick heating of the Hot Water Radiator and, consequently, quicker discharge of heat to the air, is readily appreciated and

achieves considerable economy in the amount of electricity used. "Genii" H.E. Type Radiators heat up and cool down in *one fourth* the time taken by the ordinary Cast Iron Hot Water, Steam or Vapour Radiators. There is no noise, risk of explosion, internal corrosion or possibility of the Immersion Heater running dry with "Genii" Hot Water Radiators as is present in Steam or Vapour Radiators.

DESIGN.—"GENII" H.E. Type Radiators present many advantages over the heavy and cumbersome cast iron Radiators. They are constructed by threading steel plates on solid drawn brass tubes, which are expanded throughout their length by a special process, making a good metallic contact between the plates and the tubes, thus ensuring uninterrupted conduction of heat.

SPACE OCCUPIED per unit of heating surface is approximately 65 per cent. of that required by cast iron type of radiators; they are of neat and compact appearance, easily cleaned and the maximum efficiency is maintained.

STRENGTH.—"GENII" H.E. Type Radiators are tested to 300 lbs. per sq. inch before leaving the works. In normal working the limit of pressure is 5 to 10 lbs. per sq. inch. There is thus a great margin of safety which renders the "GENII" H.E. Type Radiator absolutely safe in working. Furthermore, they are not liable to fracture by temperature changes, attack by frost, or during handling in transit and erection.

There is no necessity for automatic devices, safety valves, drain cocks, etc.

WEIGHT AND WATER CAPACITY.—The weight is about 50 per cent. of equivalent cast iron radiators. The average water capacity is approximately .37 lbs. per sq. foot of heating surface, about $\frac{1}{4}$ of the capacity of standard cast iron radiators, and the heat is given out in a fraction of the time required by other makes.

These are factors of much importance in the saving of electricity, heating results, saving in transport costs, breakages, labour, handling on site and erection.

The excessive weight of ordinary cast iron radiators and their contents is very considerable, and in the case of Traction or Marine Work, this dead weight would have to be paid for in the extra consumption of coal or electricity to carry them.

ADAPTABILITY.—"GENII" H.E. Radiators can be supplied in any height or length to suit special requirements, and can be made 3 ins. wide or less for narrow positions where little space is available.

SUGGESTIONS FOR WARMING INSTALLATIONS.

A more equable heating effect or better distribution of heat is obtained by the use of two or more Radiators for a large room instead of one large Radiator.

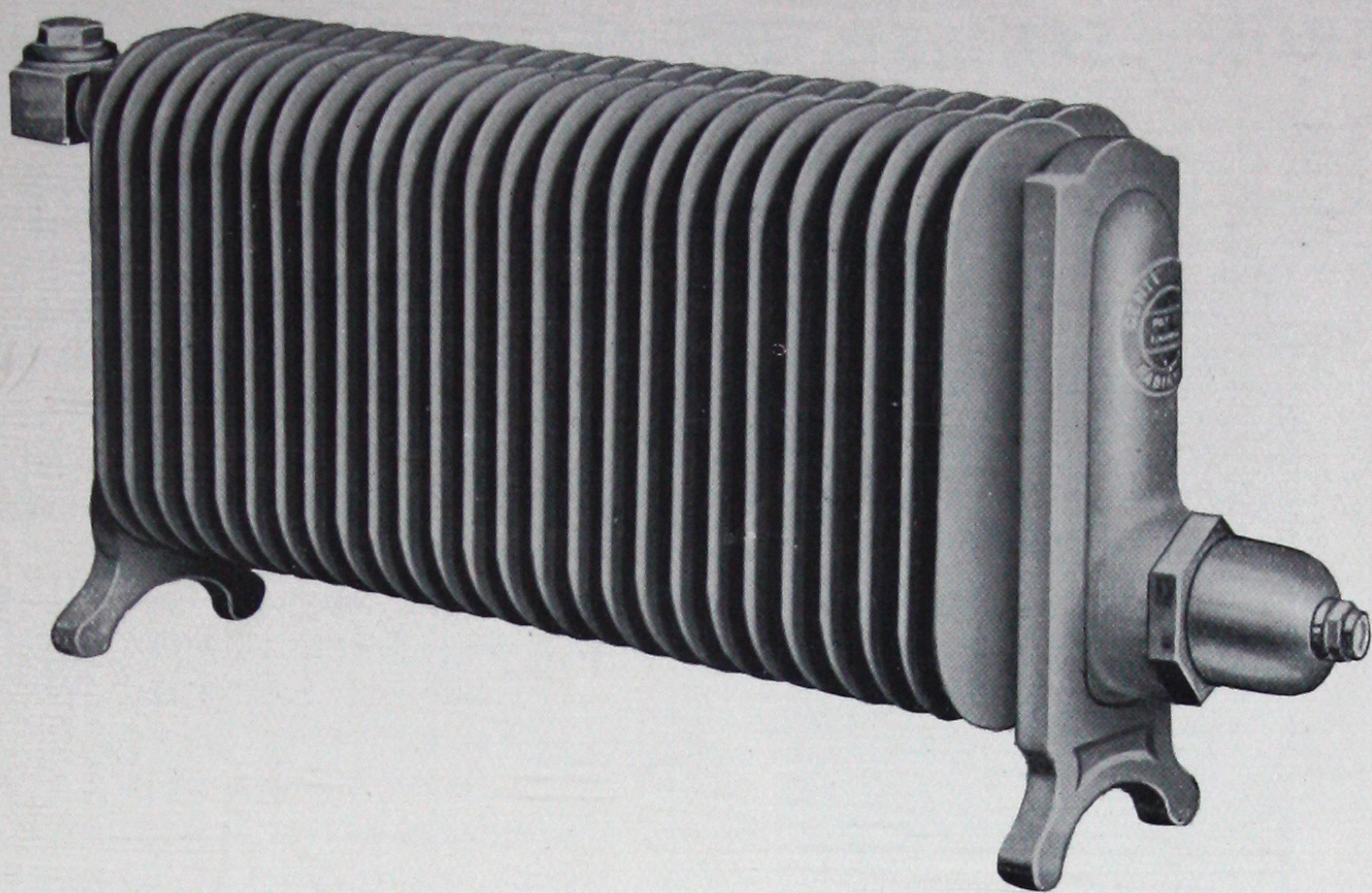
Instal the Radiator in the cold or draughty position of the room, under the window, or window seat is usually the most suitable position. "GENII" H.E. Radiators being low in height are particularly suitable to counteract the cooling effect of a window. Select a radiator as long as possible so that the ascending warm air covers the window surface area effectively. Tall and narrow radiators tend to cause draughts and give a "patchy" heating effect besides being less efficient.

"GENII" HEATING TABLE.

Quantity of Heating Surface recommended when using "GENII" H.E. Type Radiators for warming various kinds of brick and stone buildings with normal glass area and exposure.

DESCRIPTION	Genii "H.E." Type Heating Surface recommended per 1000 cub. ft. of space.
Living and Dressing Rooms, Offices and Writing Rooms	18 square feet.
Banks, Schools, Entrance Halls and Work Rooms	16 "
Theatres, Cinemas, Concert and Dancing Halls having close seating accomodation	14 "
Factories, Machine Shops	14 "
Bedrooms, Large Public Halls, Churches	12 "
Garages, Store Rooms, Skating Rinks	10 "

Where "GENII" Radiators are used as auxiliary heat to a Coal or Electric Fire, allow about HALF the above heating surface ratings.



“GENII” H.E. TYPE RADIATOR.
For Land, Marine and Traction Work

Comprising: Thermo-patent gilled Radiator, cast brass end Headers, solid drawn brass horizontal circulating tubes, “ GENII ” Immersion Heater with brass terminal box for single or 3-heat regulation as detailed, brass Filler and Plug.

CODE AND CATALOGUE NUMBERS	Max Watts Loading. “ R ” Heat Regulation	Approximate Heating Surface		Approximate Height overall		Approximate Length over Bosses		Approximate Width		Approximate Weight	
		sq. ft.	square metres	ins.	cms.	ins.	cms.	ins.	cms.	lbs.	kg.
470	250	6	0.557	6 ⁷ / ₈	17.5	16 ¹ / ₂	42.0	4 ¹ / ₂	11.5	14	6.35
471	500	12	1.114	6 ⁷ / ₈	17.5	28 ¹ / ₄	71.5	4 ¹ / ₂	11.5	22	9.98
472	750	18	1.671	8 ³ / ₄	22.5	30 ¹ / ₂	77.5	4 ¹ / ₂	11.5	36	16.33
473	750R	20	1.858	15 ⁷ / ₈	40.5	18 ¹ / ₄	46.5	6 ¹ / ₂	16.5	53	24.0
474	1000	24	2.228	8 ³ / ₄	22.5	40	101.0	4 ¹ / ₂	11.5	45	20.5
475	1000R	26	2.415	15 ⁷ / ₈	40.5	22 ¹ / ₄	56.5	6 ¹ / ₂	16.5	62	28.1
476	1500R	39	3.623	15 ⁷ / ₈	40.5	30 ³ / ₄	78.0	6 ¹ / ₂	16.5	80	36.28
477	2000R	50	4.642	15 ⁷ / ₈	40.5	37 ¹ / ₂	95.0	6 ¹ / ₂	16.5	96	43.5
478	2000R	51	4.735	21 ¹ / ₂	54.5	28 ¹ / ₂	72.0	6 ¹ / ₂	16.5	95	43.0
479	2500R	60	5.570	15 ⁷ / ₈	40.5	44 ¹ / ₂	121.0	6 ¹ / ₂	16.5	112	46.25
480	2500R	62	5.756	21 ¹ / ₂	54.5	33	83.0	6 ¹ / ₂	16.5	107	44.0
481	3000R	73	6.778	21 ¹ / ₂	54.5	37 ¹ / ₂	95.0	6 ¹ / ₂	16.5	122	56.25
482	3000R	75	6.964	27	68.5	35 ¹ / ₂	90.0	6 ¹ / ₂	16.5	143	77.0

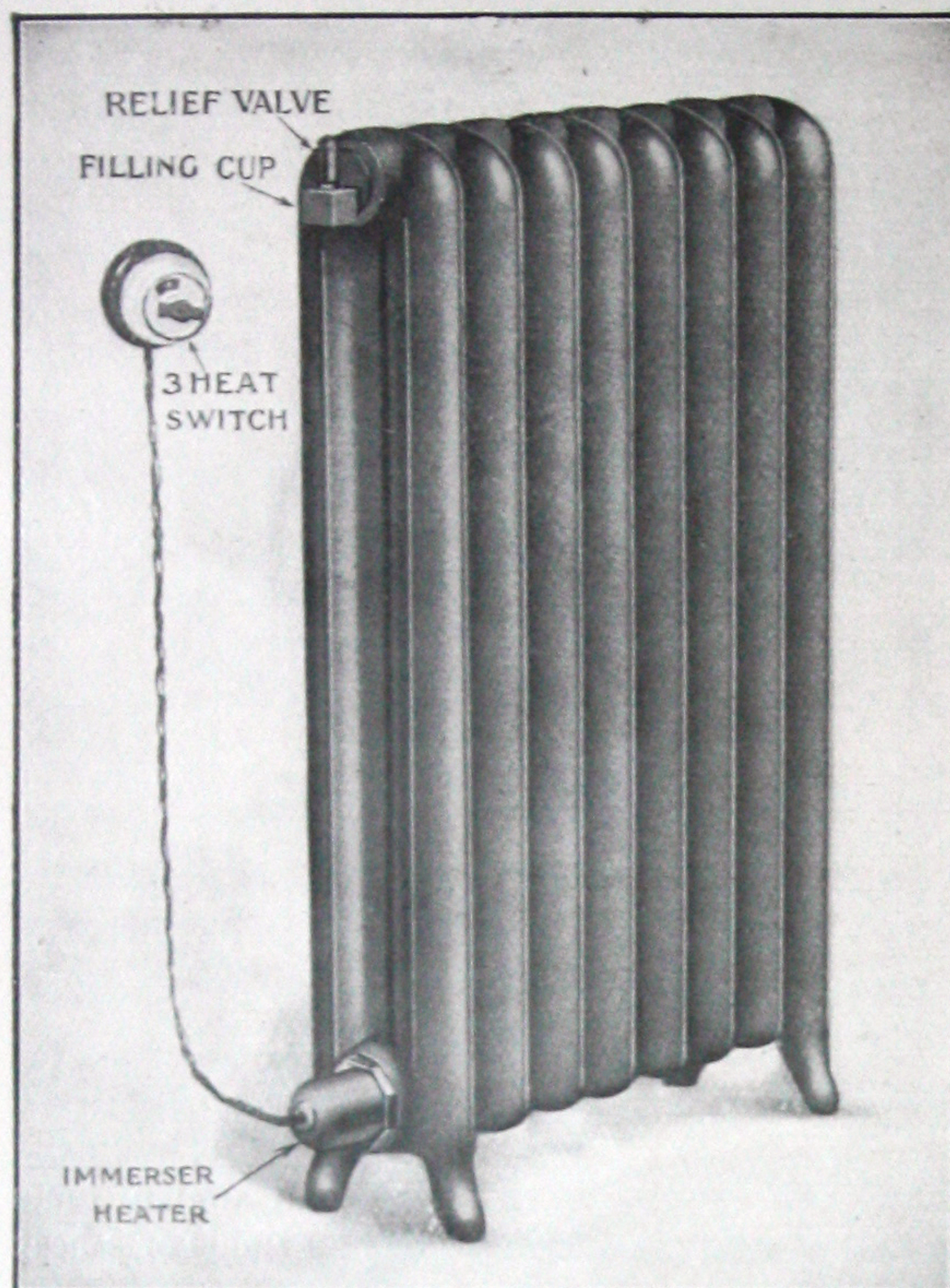
FINISH.—“ Genii ” Radiators are enamelled dull black but can be finished in colours as desired or aluminium painted.

Made for Standard Voltages 100-250. Other Voltages and special size Radiators made to order.

For overall length allow 3 inches (8 cms.) for terminal cap.

The Radiators marked “ R ” in the second column are fitted with three terminals suitable for three heat regulation. Particulars of Single and Three Heat Regulating Switches are given in the leafle dealing with fixed type Immersion Heaters, and prices in price sheet under Code Numbers 150-155 and 160-165.

CAST IRON TYPE ELECTRIC HOT WATER RADIATOR



C.I. TYPE.

When it is desired to convert the ordinary standard cast iron radiators as used for Central Heating to Electrical Heating, we are prepared to supply the electrical heating equipment; this is quite simple to apply and should consist of:—

1. A "GENII" Patent Immersion Heater, particulars of 50 different types and sizes are given in our Immersion Heater section of Catalogue.
2. A Water level test cock. Code No. 60.
3. A water filler fitted with "GENII" Patent Combined Safety and Vacuum Relief Valve. Code No. 61.

We are always pleased to advise upon the suitable size of Immersion Heater upon receipt of particulars of the size and type of Radiator to be converted.

For those who prefer us to supply the complete Cast Iron Electric Hot Water Radiator, the appended schedule of sizes will meet average requirements.

"GENII" CAST IRON (C.I.) TYPE ELECTRIC HOT WATER RADIATORS

Comprising Heavy Cast Iron Radiator, a Three-heat type "Genii" Immersion Heater, Water Filler, fitted with "Genii" Patent Combined Safety and Vacuum Relief Valve.

CODE AND CATALOGUE NUMBERS	Max Watt Rating 3-Heat Regulation	Heating Surface in Square		Height		Length		Width		Weight Approximate	
		feet	metres	ins.	cms.	ins.	cms.	ins.	cms.	lb.	kg.
490	1000	15	1.50	32	81	21	54	5½	14	110	50
491	1500	24	2.23	38	97	27	69	5½	14	175	80
492	2000	32	2.97	38	97	27	69	8½	22	230	105
493	2500	40	3.71	38	97	33	84	8½	22	285	139
494	3000	48	4.45	38	97	39	91	8½	22	340	155

Particulars of suitable Single and Three-heat Regulating Switches mounted on wood block with flexible cable are detailed under Code Nos. 150-155, or with switch and fuse board and wiring in flexible metallic tubing, Code Nos. 160-165, Immersion Heater Section.

Made for all standard medium pressures of 100-250 volts.

Special sizes of Radiators and Voltages made to order.

GEORGE NOBBS LTD.

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LONDON.

TELEPHONE:
MUSEUM, 3455
Codes: A.B.C. 5th Edition.

“GENII NEPTUNE” Electric Hotwater Radiators FOR MARINE AND LAND WORK

Patent Nos. : British, 12318/15, 18891/18, 150074, 153513, 2489/14.
U.S.A., 268310. Other patents pending.

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Heating without Boilers, Flues, Piping or Poisonous Fumes

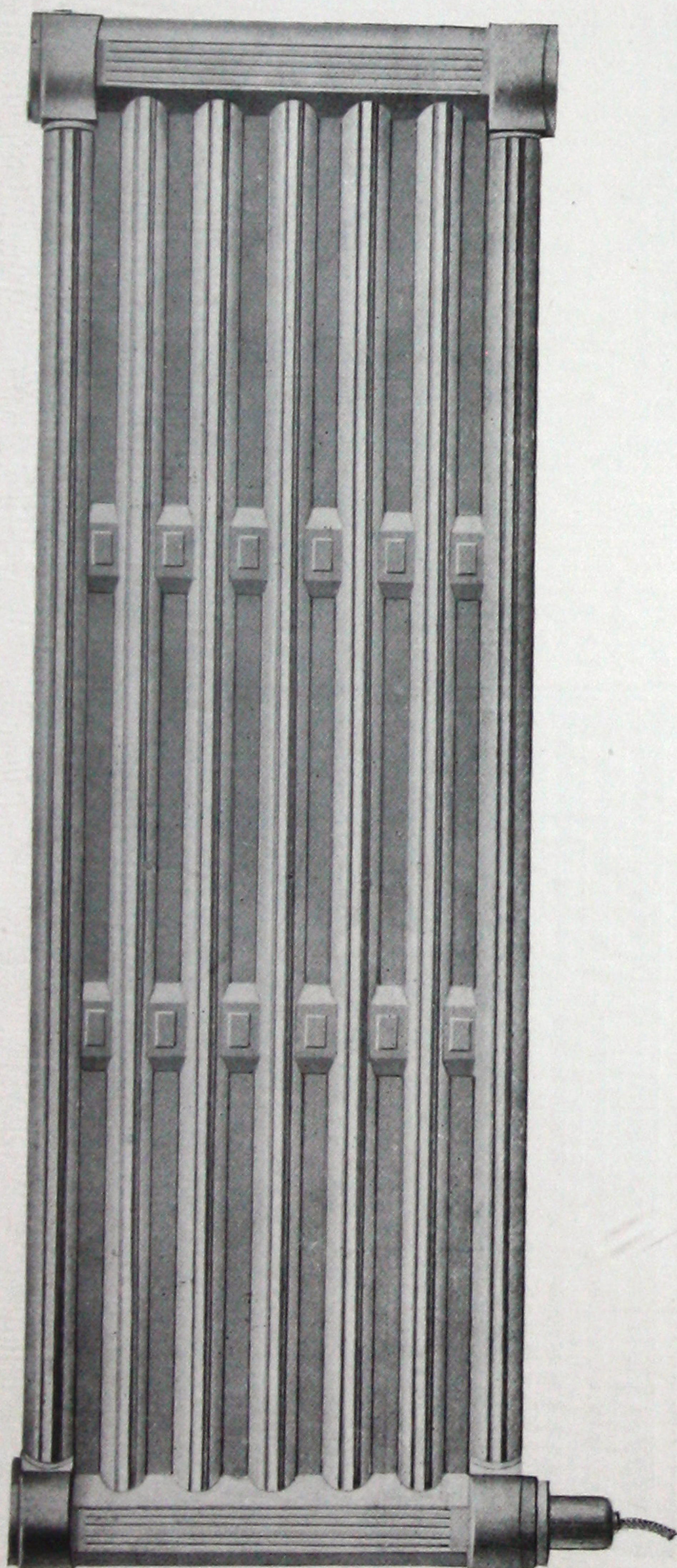


FIG. 2

500 WATT UNIT.
Code No. 509. One Sixth full size.

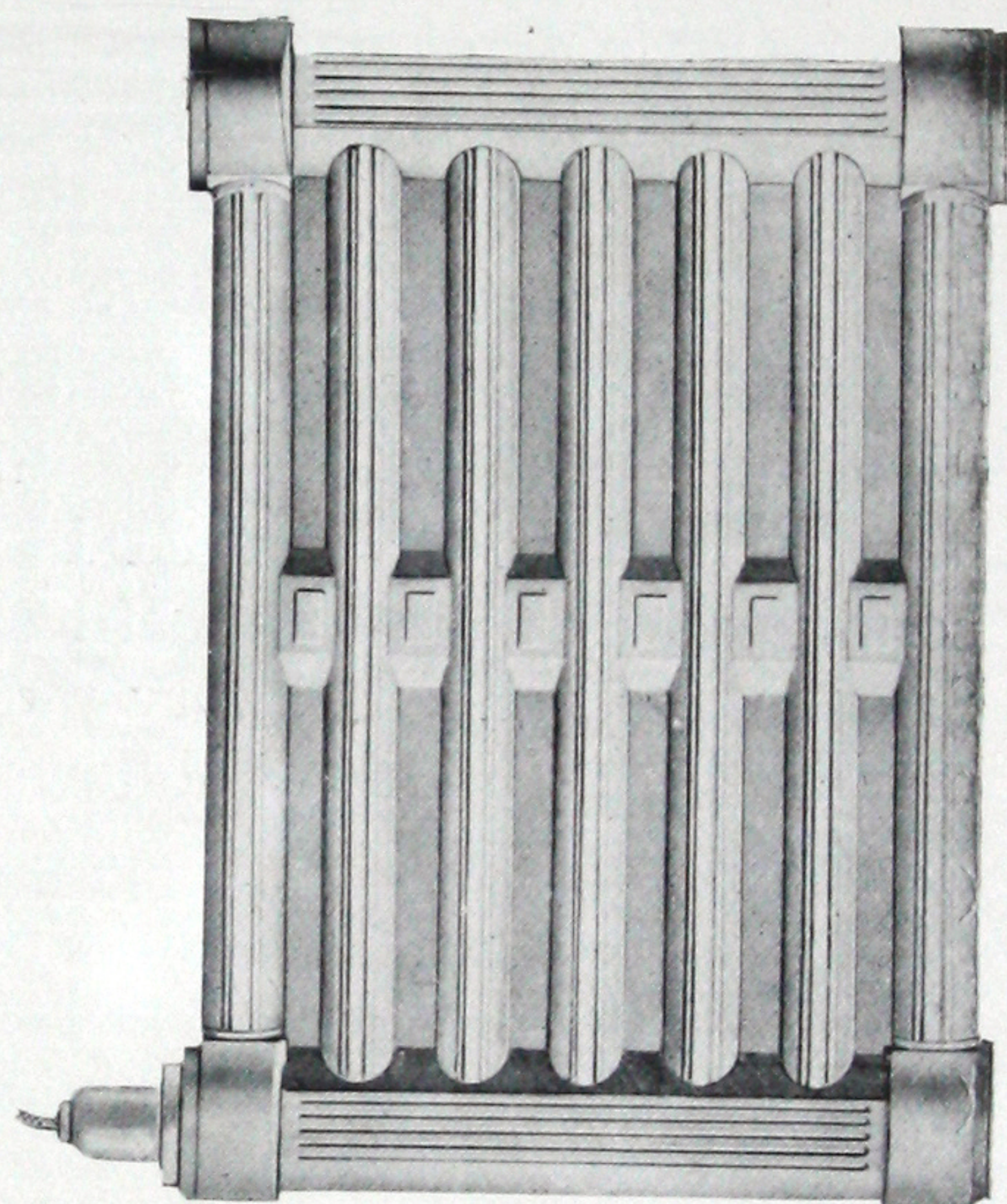


FIG. 1

250 WATT UNIT.
Code No. 501. One sixth full size.

The “GENII NEPTUNE” Radiator is an entirely new idea. Harmonious in its proportions, graceful of outline, it is a model of compactness, and yet unsurpassed in heating power.

The practical advantages of the “GENII NEPTUNE” Radiator are as important as its artistic features. The reduced size of the columns and their symmetrical spacing permit 50 per cent. more heating surface to be obtained in a given area than with any other type of cast iron radiator of equal height.

The Immersion Heater is of particularly robust construction. It consists of a special form of " GENII " Blade-type Heater double wound for low temperature working thus ensuring a long life. The heating element is enclosed in a heavy copper tinned sheath of patented construction, terminating in a flanged gunmetal boss with terminal cap and securely fitted to the boss of the radiator.

" GENII NEPTUNE " Radiators are constructed on the unit principle in two standard units or sections as Figs. 1 and 2, loaded for 250 and 500 watts respectively.

These sections when assembled together side by side, as shewn in Figs. 4, 5, 7 and 8, form larger complete radiators to the loadings specified ; but where the space available does not permit " side by side " units, then sections may be bolted back to back to form a Tandem Radiator (Code Nos. 505-6-7-8 and 513-14-15-16). This method of fixing is shown in Fig. 3, applied to the 500 watt unit. A similar arrangement can be used with the 250 watt unit.

Where space permits and a powerful radiator is required, it is preferable to use single depth radiators as these give a better heat distribution, while the initial cost is less than for tandem radiators. Figs. 6 and 9 show the end views of single depth radiators in the two sizes.

For warming a large room it is preferable to use two or more small radiators instead of one large radiator, thus securing a better heat control and more equable heat distribution.

The " GENII NEPTUNE " Radiator is particularly suitable to meet conditions that apply aboard ship for the warming of Cabins, State Rooms, Saloons, etc., and for every purpose where space is limited. Such conditions may be stated briefly as follows :—

- (a) Limited bulkhead space. Radiators must be of compact and elegant design ; preferably tall and narrow and of small projection.
- (b) Radiators must be supplied with brackets for fixing to the bulkhead only and clear of the deck.
- (c) The Heating Element to consist of a specially robust form of Immersion Heater having its terminals enclosed in gunmetal or brass terminal box. No elements are to be exposed to the air.
- (d) The temperature of the radiator heating surfaces when working must not exceed that of low pressure steam.
- (e) The radiator must be so constructed that the Immersion Heater is not exposed from the water within it when the ship is weathering heavy seas.
- (f) Radiators must be capable of withstanding a hydrostatic test pressure of 500 lbs. per square inch and 200 lbs. steam pressure.
- (g) Radiators to be noiseless in working, quick in heating and cooling (" GENII NEPTUNE " Radiators heat up in one fourth the time taken by ordinary cast iron radiators).
- (h) Radiators to be finished with aluminium paint or in electro-oxidised Silver, Copper or Bronze, as specified.

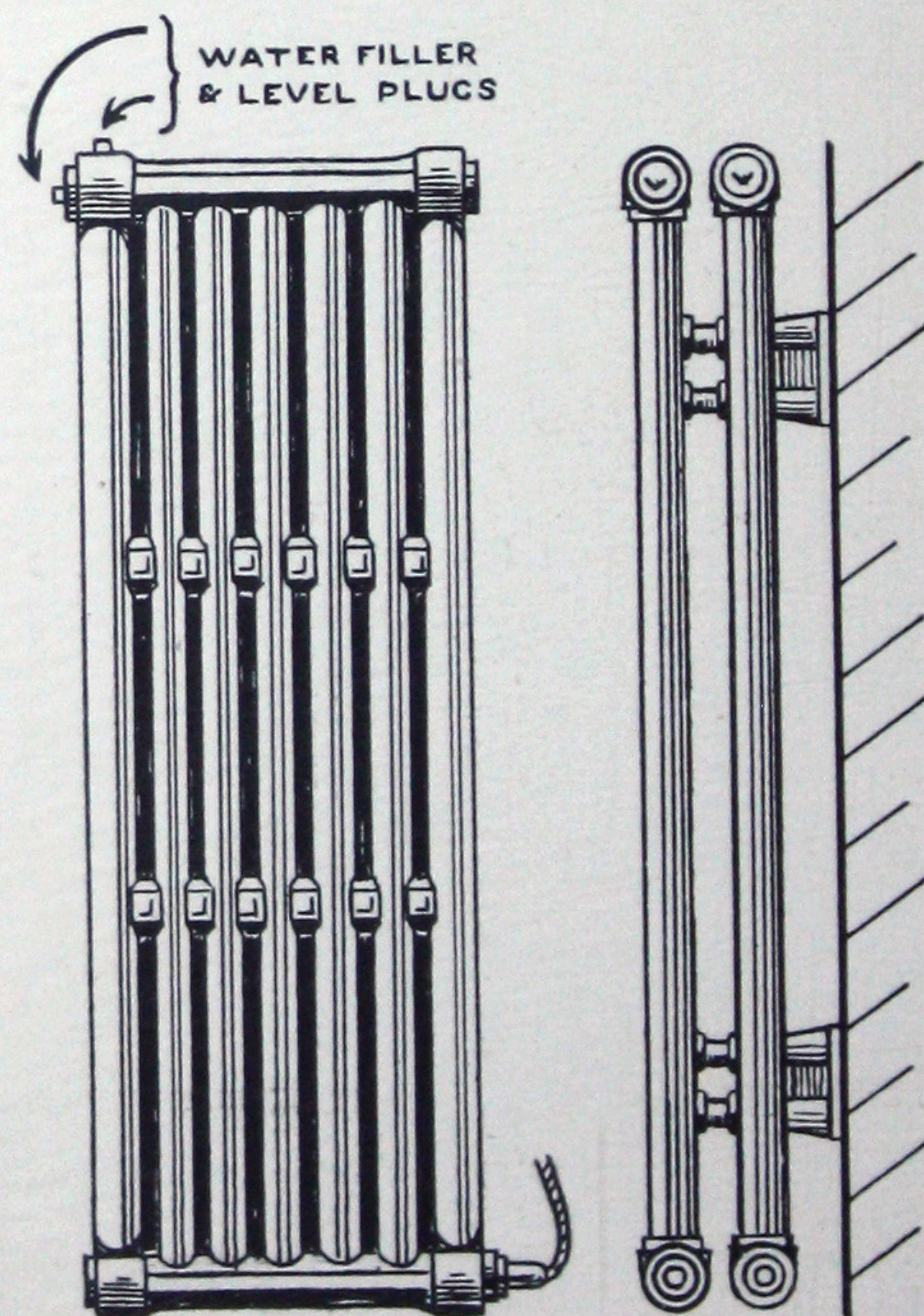


FIG. 3.
Two 500 WATT UNITS ARRANGED IN TANDEM
FASHION TO FORM 1000 WATT RADIATOR.
Code No. 513.

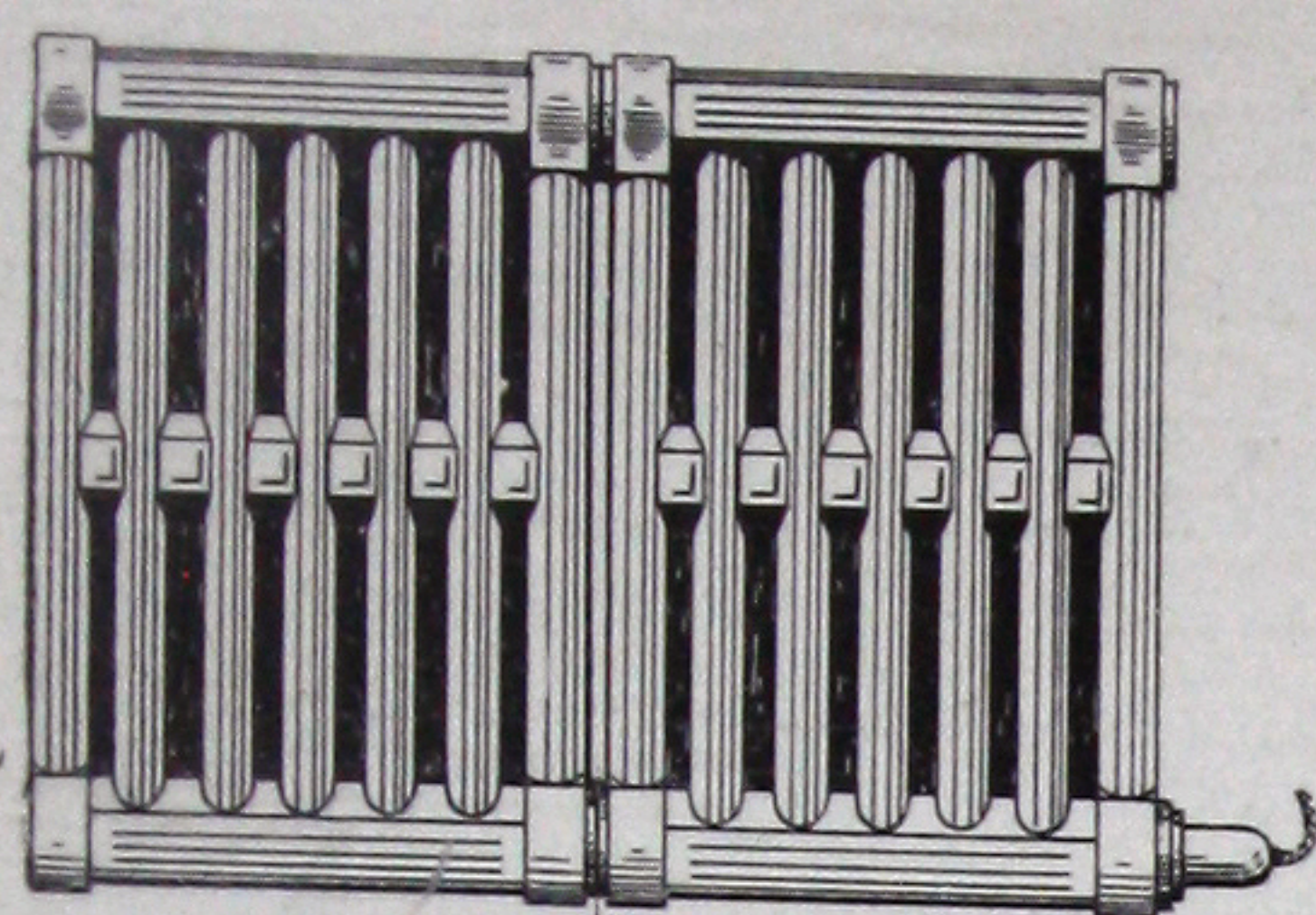


FIG. 4.
TWO 250 WATT UNITS
ARRANGED AS 500 WATT
RADIATOR
Code No. 502.

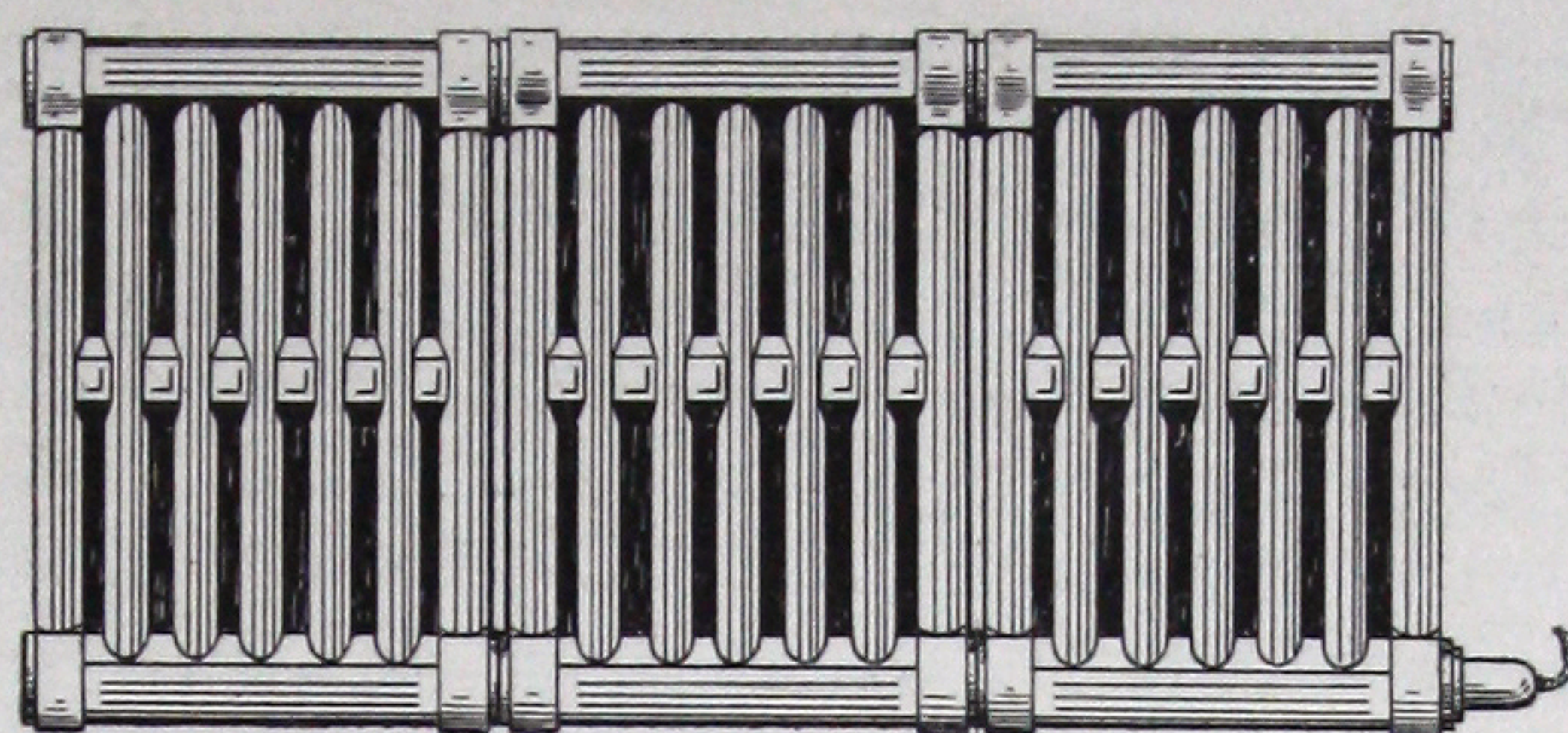


FIG. 5.
THREE 250 WATT UNITS ARRANGED AS
750 WATT RADIATOR.
Code No. 503.

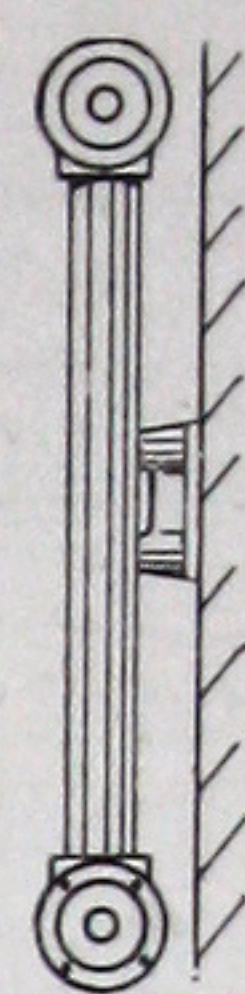


FIG. 6.
END VIEW OF RADIATOR
BUILT UP OF 250 WATT
UNITS.

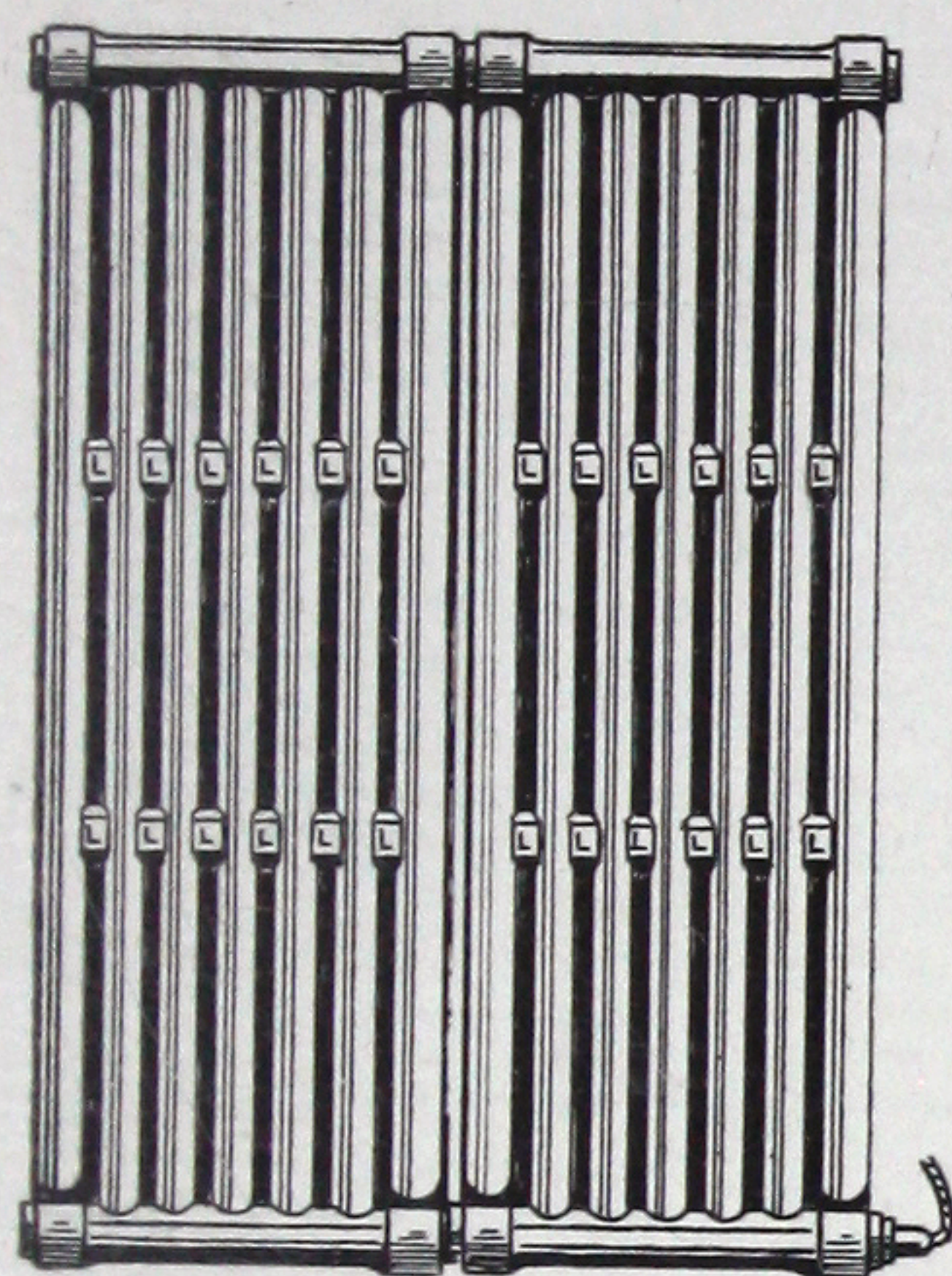


FIG. 7.
TWO 500 WATT UNITS
ARRANGED AS 1000 WATT
RADIATOR.
Code No. 510.

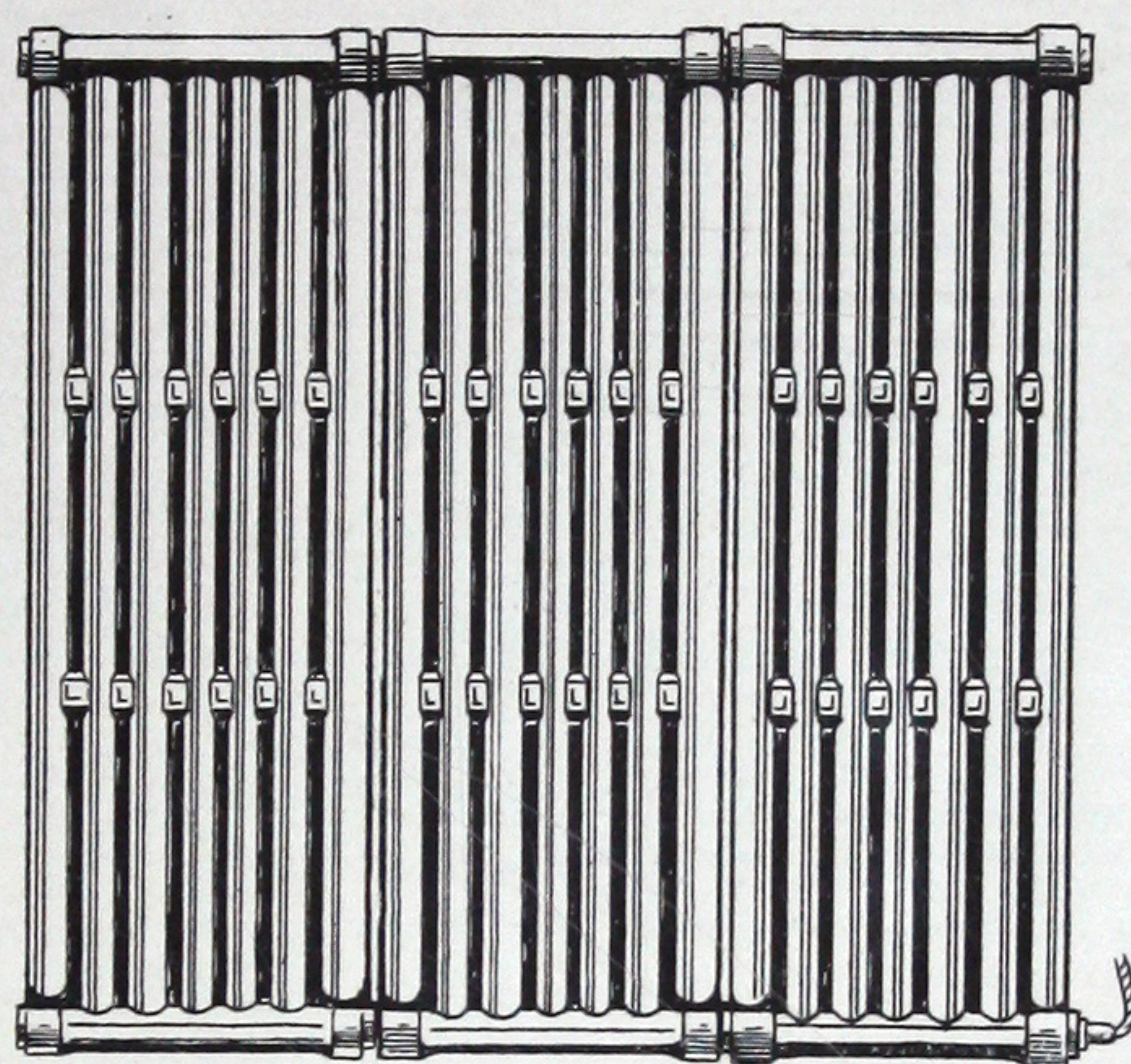


FIG. 8.
THREE 500 WATT UNITS ARRANGED AS
1500 WATT RADIATOR.
Code No. 511.

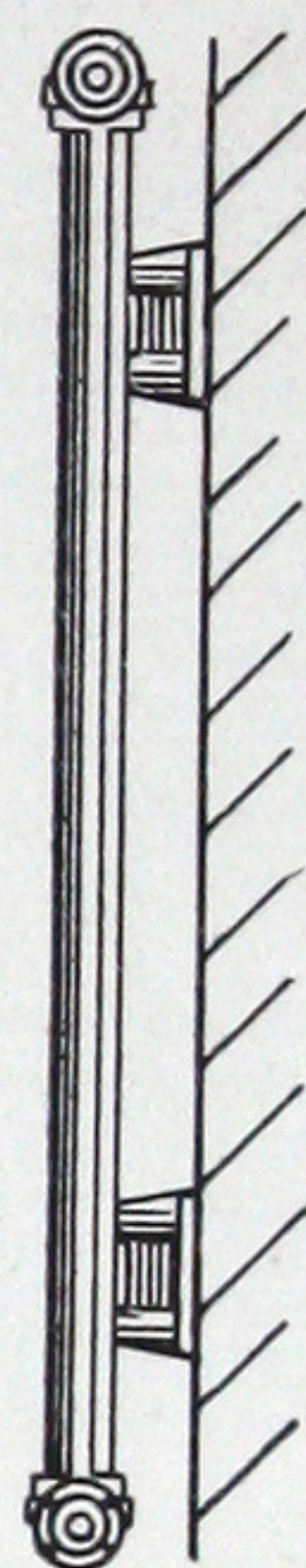


FIG. 9.
END VIEW OF RADIATOR
BUILT UP OF 500 WATT
UNITS.

"GENII NEPTUNE" Radiators completely fulfil all these special requirements for Marine Type Heaters. In this respect they stand in a class unapproached by any other pattern of radiator whatever.

"GENII NEPTUNE" Radiators are eminently suitable for warming Houses, Flats, Offices, Theatres, Hospitals, Churches, Schools, Public Buildings, Garages, Halls, Bath Rooms, Linen Rooms, Drying Rooms, etc., etc., and can be economically installed in small units ensuring perfect control.

"ON THE WALL—OFF THE FLOOR—OUT OF THE WAY."
"OBVIATE FIRE RISK."

SUGGESTIONS FOR WARMING.—The Company has on its staff heating engineers of long and wide experience in all systems of warming and will always be glad to suggest applications of "GENII" Radiators upon receipt of plans and particulars of the duty required.

For heating calculations allow the usual 3410 British Thermal units per kilowatt hour, as "GENII NEPTUNE" Radiators have a direct air warming efficiency of 100 per cent.

Where "GENII NEPTUNE" Radiators are used as supplementary heat to a coal or electric fire, allow about HALF the calculated wattage rating.

INSTALLATION NOTE.

To ensure the best results, "GENII NEPTUNE" Radiators should be fixed level and with the immersion heater at the bottom as shewn in the illustrations.

To set the Radiator to work, unscrew the two small plugs near top. Fill the Radiator with water until water begins to run from the small lower plug. Then screw up both plugs pressure tight, when the Radiator will be ready for use. The positions of the two plugs are shown at the top left hand corner of the Radiator in Fig. 3.

Since the water should be replenished when required, it is important to screw the plugs up tightly so that very little loss of water takes place, even during many months of use.

HEAT REGULATION.—Two terminals are provided on each immersion heater for single heat regulation. Tandem Radiators and those specially indicated in the table by the letter R in the fourth column, are suitable for two or three heat regulation, which may be accomplished by connecting the terminals of the immersion heaters to separate switches or to an ordinary three heat series parallel switch. For particulars of these single and three heat switch sets of the indicating pattern see Leaflet Y. 201 under Code Nos. 150-155.

STANDARD CONSTRUCTION AND FINISH.—The Radiator housing is constructed of best quality, fine grained cast iron, finished in aluminium colour, fitted with special "GENII" Blade-type immersion heater and brass terminal box, water filler and water level plugs.

Unless otherwise specified, "GENII NEPTUNE" Radiators are finished with a coat of aluminium paint, but special finishes can be supplied in electro-oxidised silver, copper, brass or bronze plating.

Particulars of Standard Sizes of "Genii Neptune" Radiators.

Pattern.	No. of Sections.	Code & Cata. No.	Watts. Maxim.	Height.		*Length		Width or Projection.				Weight	
				ins.	cms.	ins.	cms.	Nett.		With Bracket.		includ. bracket	
								ins.	cms.	ins.	cms.	lbs.	kg.
SIDE-BY-SIDE, 250 watt units	1	501	250	16	40.5	10 $\frac{5}{8}$	27	2 $\frac{1}{4}$	5.7	3 $\frac{3}{4}$	9.5	20	9.0
	2	502	500	16	40.5	21 $\frac{1}{4}$	54	2 $\frac{1}{4}$	5.7	3 $\frac{3}{4}$	9.5	39	17.7
	3	503	750	16	40.5	31 $\frac{7}{8}$	81	2 $\frac{1}{4}$	5.7	3 $\frac{3}{4}$	9.5	58	26.4
	4	504	1000	16	40.5	42 $\frac{1}{2}$	108	2 $\frac{1}{4}$	5.7	3 $\frac{3}{4}$	9.5	78	35.4
TANDEM, 250 watt units ...	2	505	500R	16	40.5	10 $\frac{5}{8}$	27	4 $\frac{1}{2}$	11.4	6	15.0	35	15.8
	4	506	1000R	16	40.5	21 $\frac{1}{4}$	54	4 $\frac{1}{2}$	11.4	6	15.0	73	33.2
	6	507	1500R	16	40.5	31 $\frac{7}{8}$	81	4 $\frac{1}{2}$	11.4	6	15.0	111	50.5
	8	508	2000R	16	40.5	42 $\frac{1}{2}$	108	4 $\frac{1}{2}$	11.4	6	15.0	150	68.0
SIDE-BY-SIDE, 500 watt units	1	509	500	32	81.0	10 $\frac{5}{8}$	27	2 $\frac{1}{4}$	5.7	3 $\frac{3}{4}$	9.5	37	16.7
	2	510	1000R	32	81.0	21 $\frac{1}{4}$	54	2 $\frac{1}{4}$	5.7	3 $\frac{3}{4}$	9.5	74	33.6
	3	511	1500R	32	81.0	31 $\frac{7}{8}$	81	2 $\frac{1}{4}$	5.7	3 $\frac{3}{4}$	9.5	110	50.0
	4	512	2000R	32	81.0	42 $\frac{1}{2}$	108	2 $\frac{1}{4}$	5.7	3 $\frac{3}{4}$	9.5	148	67.2
TANDEM, 500 watt units ...	2	513	1000R	32	81.0	10 $\frac{5}{8}$	27	4 $\frac{1}{2}$	11.4	6	15.0	70	32.8
	4	514	2000R	32	81.0	21 $\frac{1}{4}$	54	4 $\frac{1}{2}$	11.4	6	15.0	143	65.0
	6	515	3000R	32	81.0	31 $\frac{7}{8}$	81	4 $\frac{1}{2}$	11.4	6	15.0	215	97.5
	8	516	4000R	32	81.0	42 $\frac{1}{2}$	108	4 $\frac{1}{2}$	11.4	6	15.0	290	130.0

*NOTE.—For overall length add 1 $\frac{3}{4}$ inches (4.5 cms) for immersion heater terminal cap.

HEAT REGULATION SWITCH SETS may be fitted to the Radiators marked R in the fourth column of table. For particulars and Code Numbers see Leaflet No. Y. 201.

All Radiators are supplied with fixing brackets.

Total projection from back of bracket to front of Radiator can be reduced by half an inch (12 m.m.) by cutting down the distance snugs on the brackets.

GEORGE NOBBS LTD.

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HEAD OFFICE,

89, CLEVELAND STREET,
FITZROY SQUARE, LONDON, W.1.

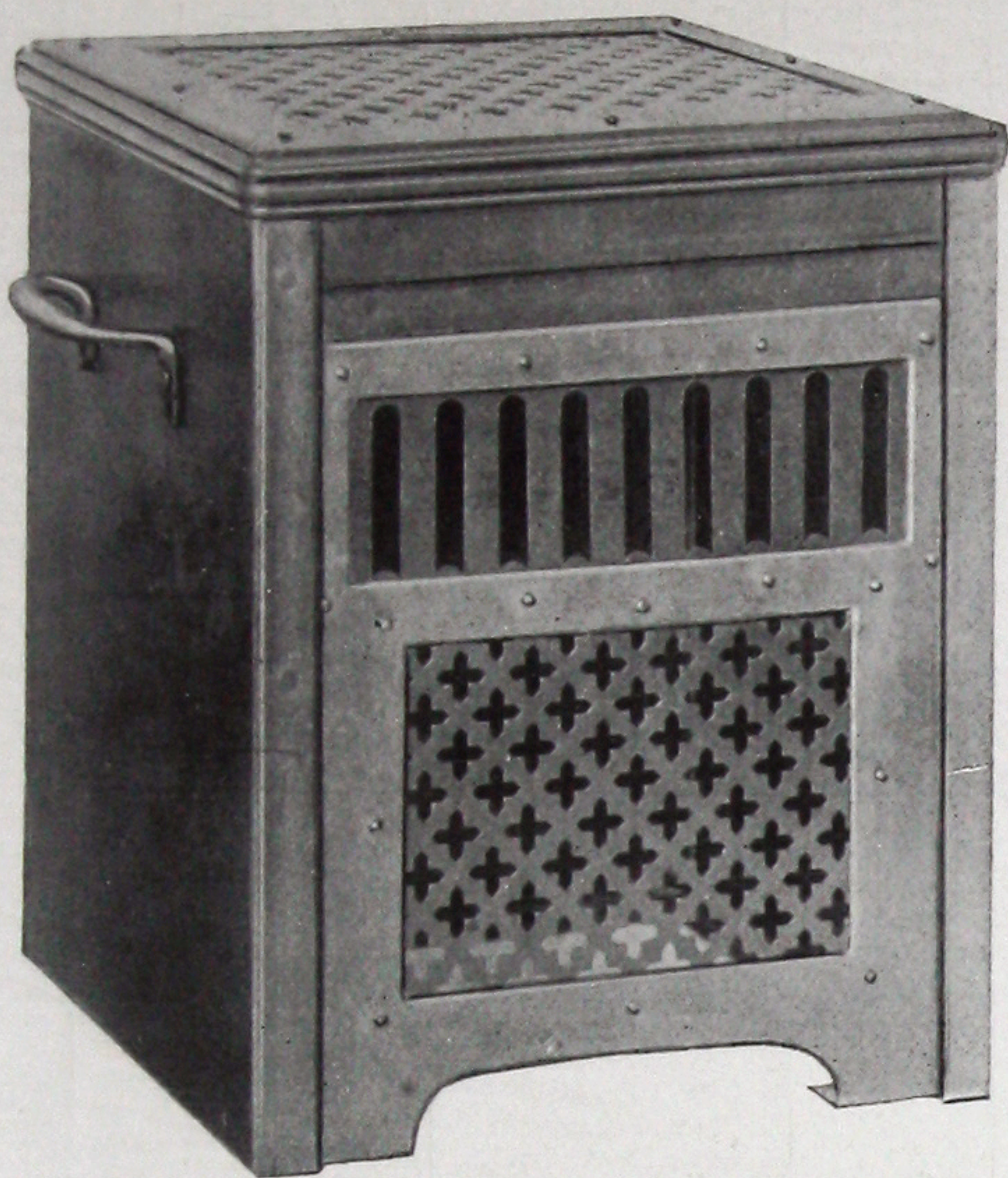
WORKS, LONDON & MANCHESTER.

TELEGRAMS:
"ELECTRISZ, EUSROAD"
LONDON.

TELEPHONE:
MUSEUM, 3455
Codes: A.B.C. 5th Edition.

"Genii" Air Heaters or Convector

Industrial and Tobin Tube Patterns.



FLOOR PATTERN.

The elements are wound for low current density at black temperatures to ensure "long life," and are bolted to wrought iron frames, mica insulated and enclosed within steel casings perforated for free air circulation. The life of these elements is four to five times that of Electric Fires.

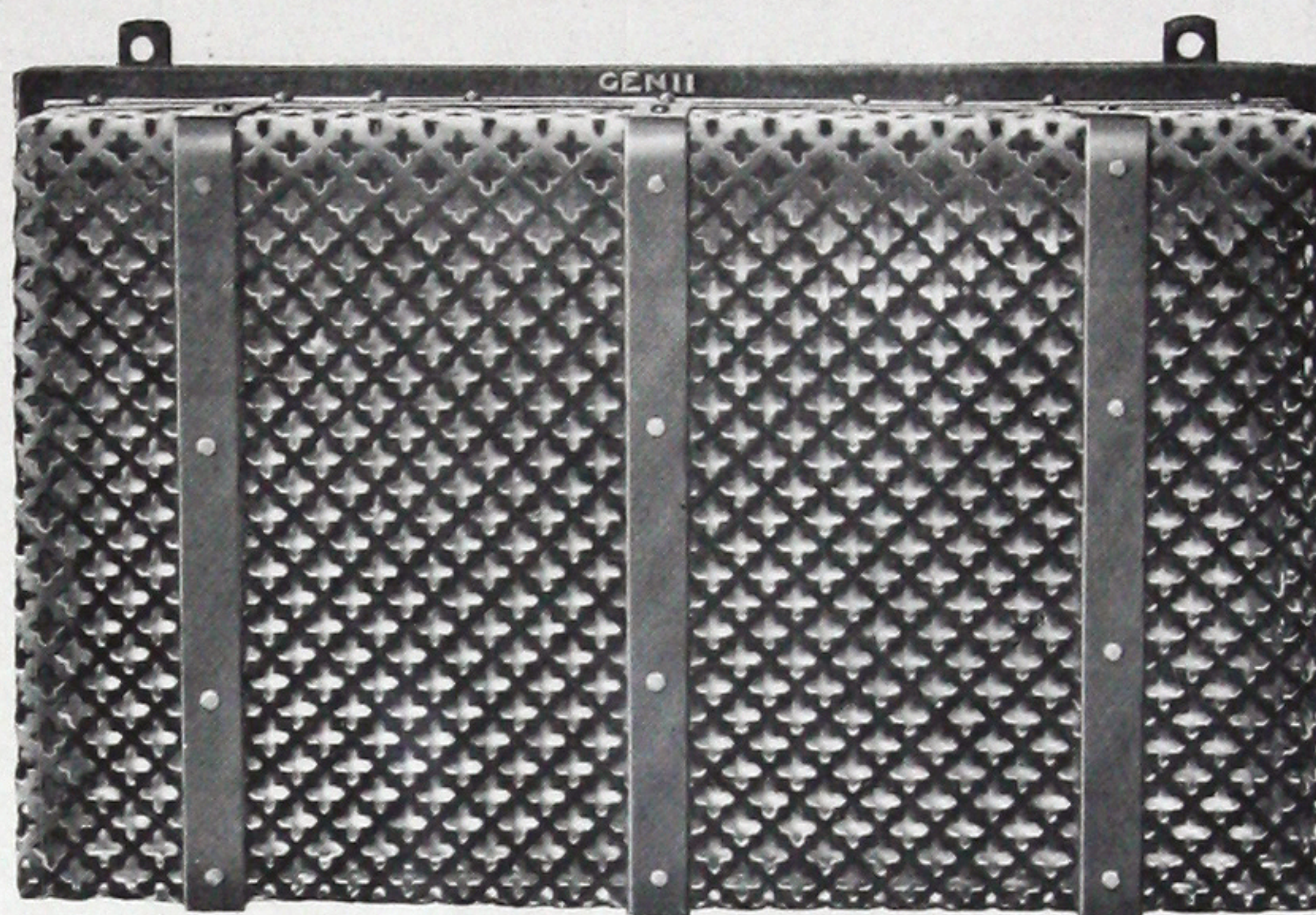
A large range of sizes and wattages are set out in the tables overleaf. Special types are made for Traction Work, Electric Locomotives, Crane Cabins, Car Heating, etc., for working direct on pressures of 100 to 2,000 volts.

Attention is drawn to the small diameter cylindrical pattern heaters with low temperature current loadings 250 to 1,000 watts with reference letter "L.T." (see third column of schedule) that are suitable for placing on the sills of windows, around skylights, etc., for prevention of cold down draughts.

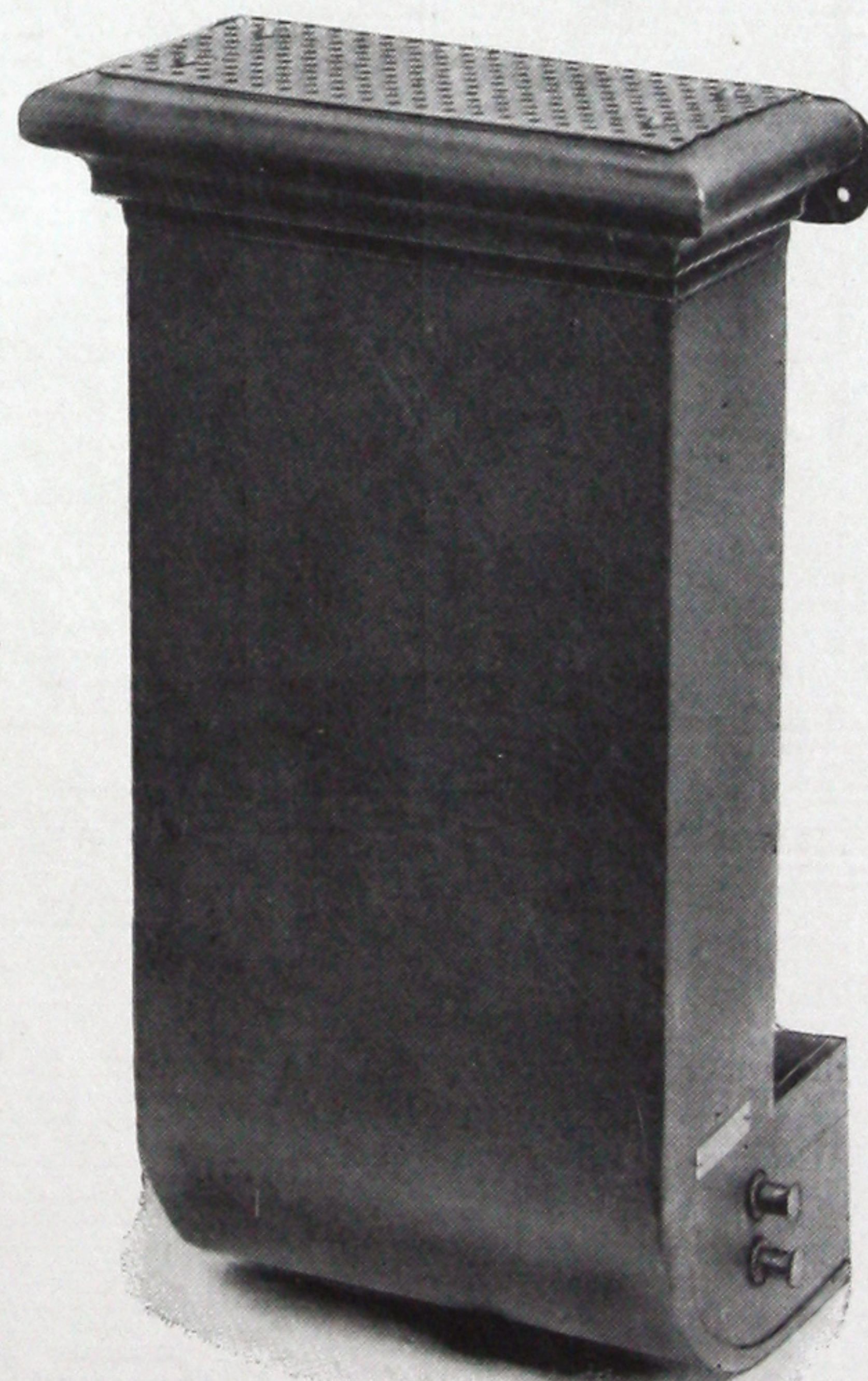
"GENII" Tobin Tube Type Fresh Air Convectors (Code Nos. 555-561) are intended for building into the outside walls, whereby fresh air is drawn into the Heater and warmed before entering the room. Heat regulation may be provided for enabling the room to be kept at any desired temperature. These Convectors are particularly suitable for Housing Schemes for combined ventilation and heating purposes. A damper can be fitted to the inlet nozzle for regulating the inflow of fresh air, and a copper fine gauze filter to prevent entry of flies and dust from outside the building.

"GENII" Air Heaters or Convectors are of substantial construction to withstand rough usage and made in a variety of patterns for Home and Industrial Heating, Car Heating, Ovens and other purposes.

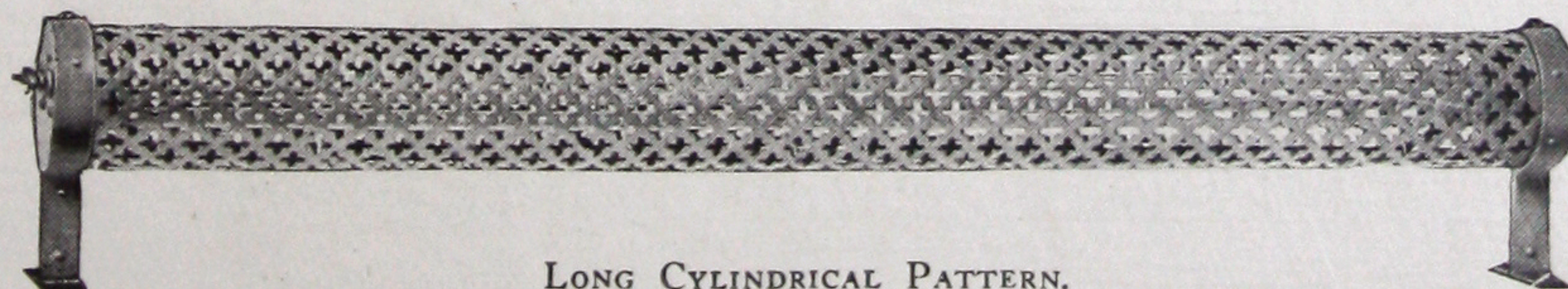
The heating medium consists of "GENII" Standard Strip Type Elements, unbreakable, interchangeable, and accessible for renewing, if required.



WALL TYPE.



FRESH AIR HEATER.



LONG CYLINDRICAL PATTERN.

SCHEDULE OF "GENII" CONVECTORS OR AIR HEATERS.

Pattern.	Code & Cata. Nos.	Watts Maximum	Height		Length		Diameter or Width		Approximate Weight	
			ins.	cms.	in	cms.	ins.	cms.	lbs.	kg.
CYLINDRICAL, 3½ in. diameter	520	250-LT	7	17.7	12	30.4	3½	8.8	4	1.8
	521	500	7	17.7	12	30.4	3½	8.8	4	1.8
	522	250-LT	7	17.7	20	50.8	3½	8.8	5	2.2
	523	500								
	524	1000								
	525	1000 R								
	526	500-LT	7	17.7	36	91.2	3½	8.8	7	3.1
	527	1000								
	528	1000 R								
	529	1000 R								
	530	1500 R	7	17.7	48	121	3½	8.8	9	4.0
	531	2000 R								
CYLINDRICAL, 6 in. diameter	532	1000 R	12	30.4	20	50.8	6	15.2	8	3.6
	533	1500 R	12	30.4	30	76.2	6	15.2	9	4.0
	534	2000 R	12	30.4	36	91.2	6	15.2	10	4.5
WALL TYPE ...	535	250-LT	12	30.4	12	30.4	4	10	8	3.6
	536	500								
	537	500-LT								
	538	1000								
	539	1000-LT	12	30.4	20	50.8	4	10	10	4.5
	540	1000 R								
	541	1500								
	542	1500 R								
	543	2000	20	50.8	20	50.8	4	10	14	6.3
	544	2000 R								
FLOOR TYPE ...	545	500	12	30.4	10	25.4	8	20	9	4.0
	546	750								
	547	1000 R								
	548	1250 R								
	549	1500 R								
	550	1500 R	24	60.8	20	50.8	8	20	28	12.7
	551	2000 R								
	552	2500 R								
	553	3000 R								
FRESH AIR TOBIN TUBE, small pat- tern, inlet nozzle 9in. x 4in. x 4in. Large pattern, inlet nozzle, 18in. x 4in. x 4in.	555	500	21	53.3	9	22.8	4	10	12	5.4
	556	750								
	557	1000								
	558	1000 R								
	559	1000 R	21	53.3	18	45.6	4	10	14	6.3
	560	1500 R								
	561	2000 R								

A regulating air damper and copper gauze air filter may be fitted to the Fresh Air Heaters. Code Numbers :—
SMALL TYPE—562 ; LARGE TYPE—563.

HEAT REGULATING SWITCH SETS may be fitted to the Heaters marked "R" in third column of schedule.—For particulars and Code Numbers see Leaflet No. Y.201.

Heaters with reference letters "L.T." shewn in third column are fitted with 125 watt size special low temperature elements, all other Heaters have 250 watt size elements to run at black temperature.

GEORGE NOBBS LTD.

Governing Director : C.G.Nobbs, M.I.E.E., M.I.H.V.E., ETC. Secretary: F.E.Nobbs.

Electrical Engineers & Manufacturers.

HEAD OFFICE,

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